Vol. 908 Number 3

A UNITED STATES DEPARTMENT OF COMMERCE PUBLICATION

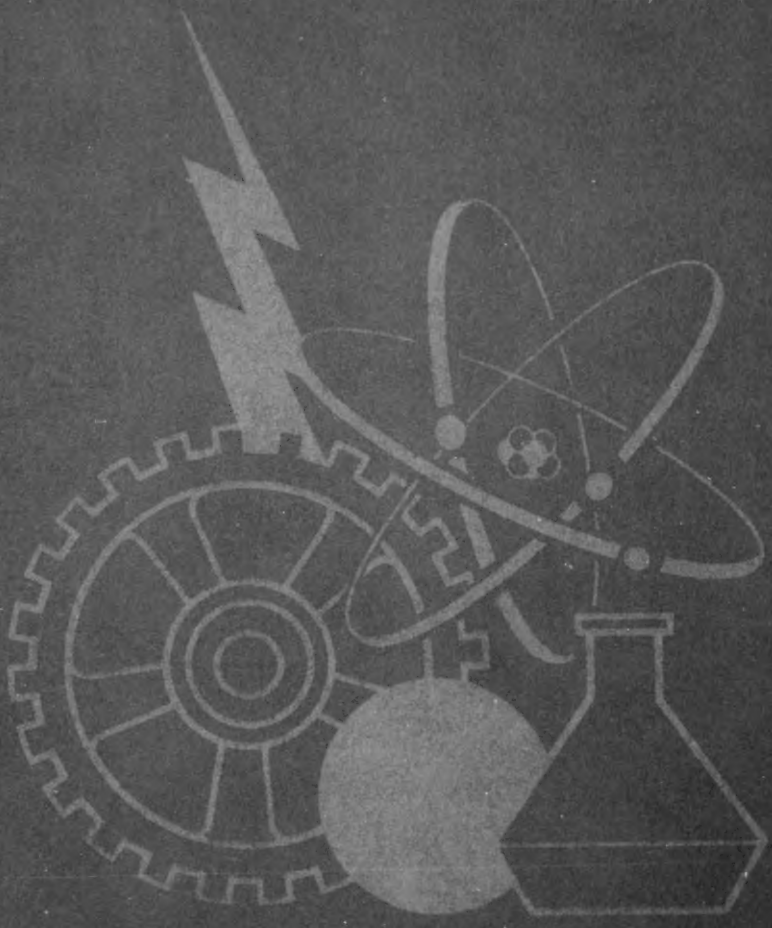
OFFICIAL GAZETTE

of the

UNITED STATES PATENT OFFICE

PATENTS

March 20, 1973



U.S. DEPARTMENT OF COMMERCE

Patent Office

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OFFICIAL GAZETTE of the UNITED STATES PATENT OFFICE

March 20, 1973 Volume 908 Number 3

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PATENT OFFICE NOTICES

Trademarks, Trade Names, and Copyrights

[19 CFR Part 133]

Filing of Increased Number of Copies of Documents With Application To Record Trademark or Copyright

Notice is hereby given that under the authority of R.S. 251, as amended (19 U.S.C. 66), and section 624, 46 Stat. 759 (19 U.S.C. 1624), it is proposed to amend §§ 133.3 and 133.33 of the Customs regulations to provide that the number of copies of documents required by the Bureau of Customs to be filed with an application to record a copyright or trademark is increased from 700 to 1,000.

Accordingly, it is proposed to amend paragraph (a) of § 133.3, and paragraph (a)(2) of § 133.33 to read as follows:

§ 133.3 *Documents and fee to accompany application.*

(a) *Documents.* The application shall be accompanied by:

(1) A status copy of the certificate of registration certified by the U.S. Patent Office showing title to be presently in the name of the applicant; and

(2) One thousand copies of this certificate, or of a U.S. Patent Office facsimile. The copies may be reproduced privately and shall be on paper approximately 8½ x 11 in size. If the certificate consists of two or more pages, the copies may be reproduced on both sides of the paper.

* * * * *

§ 133.33 *Documents and fee to accompany application.*

(a) * * *

* * * * *

(2) One thousand 8 x 10½ photographic or other likenesses reproduced on paper of any three-dimensional work, design, print, label, or other work not readily identifiable by title and author. An application shall be excepted from this requirement if it covers a work such as a book, magazine, periodical, or similar copyrighted matter readily identifiable by title and author. One thousand likenesses of a component part of a copyrighted work, together with the name or title, if any, by which the part so depicted is identifiable, may accompany an application covering an entire copyrighted work.

* * * * *

Consideration will be given to relevant data, views, or arguments pertaining to the proposed amendment which are submitted to the Commissioner of Customs, Attention: Regulations Division, Washington, D.C. 20226, and received no later than March 19, 1973.

Written material or suggestions submitted will be available for public inspection in accordance with § 103.0(b) of the Customs regulations (19 CFR 103(b)), at the Regulations Division, Bureau of Customs, Washington, D.C., during regular business hours.

Approved: Feb. 8, 1973.

EDWARD L. MORGAN,
Assistant Secretary of the Treasury.

[SEAL] EDWIN F. RAINS,
Acting Commissioner of Customs.

[FR Doc. 73-3039; Filed 2-14-73; 8:45 am]

Published in 38 F.R. 4515-4516; Feb. 15, 1973

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,628,568, M. L. Rhine, HIGH PRESSURE PUMP, **filed** Aug. 30, 1972, D.C., N.D. Ill. (Chicago), Doc. 72c2167, *TRW, Inc. (formerly Thompson Ramo Wooldridge Inc.)* v. *Ellipse Corp. and Ford Motor Company.*

2,896,857, G. R. Tompkins, WASHING APPARATUS, **filed** Sept. 30, 1968, D.C., N.D. Ohio (Cleveland), Doc. C-68-737, *Malabary Mfg. Co., George Russell Tompkins and Rexarc, Inc.* v. *Custom Power Washer, Inc.* Consent judgment; patent valid; defendants are permanently enjoined, Sept. 15, 1972.

2,899,242, G. Bombardier, ENDLESS TREAD FOR MOTOR DRIVEN VEHICLES; **3,066,546,** L. D. Thostenson, PULLEY TRANSMISSION, **D. 222,995,** Y. LaPointe, SNOWMOBILE COWL, **filed** Sept. 5, 1972 D.C., N.D. Ohio (Cleveland), Doc. C72-936, *Bombardier Limited* v. *Rupp Industries, Inc.*

2,911,729, B. A. Wood, METHOD OF AND MEANS FOR STEAM TREATING AND VIBRATING GARMENTS; **3,576,-661,** J. W. Dekoekkoek, PROCESS AND SYSTEM FOR DEWRINKLING GARMENTS, **filed** Oct. 4, 1972, D.C., E.D. Wash. (Spokane), Doc. 3717, *Western Automation Corporation and Elmer J. Williamson* v. *Crystal Laundry Company of Seattle and Colmac Industries, Inc.*

2,933,333, Bredtschneider, Drewes, Laird and Onak, PIPE COUPLING, **filed** June 12, 1972, D.C., E.D. Mich. (Detroit), Doc. 384,436, *Aeroquip Corporation* v. *Crane Company.* Plaintiff's notice of dismissal pursuant to Rule 41(a)(1)(i) F.R.C.P. entered Oct. 5, 1972.

3,027,610, O. E. Liddell, METHOD OF PROTECTING TIMBERS AGAINST MARINE BORER ATTACK, **filed** Oct. 19, 1972, D.C., C.D. Calif. (Los Angeles), Doc. 72-2496-IH, *Osmose Wood Preserving Co. of America, Inc. and Harry W. Stiritz, Jr.* v. *The Zippertubing Co., and Wm. A. Plummer and J. Maurer.*

3,066,546. (See 2,889,242.)

3,068,484, Moehlenpah and Pallme, APPARATUS FOR FABRICATING WOOD STRUCTURES; **3,069,684,** same, **filed** Aug. 13, 1970, D.C., E.D. Mich. (Detroit), Doc. 35242, *Hydro-Air Engineering, Inc.* v. *Truswal Systems, Inc. et al.* Consent decree; patents valid; defendants have infringed, plaintiff is owner of Letters Patent, counterclaims and Count 2 of the complaint as amended are dismissed, Oct. 11, 1972.

3,069,684. (See 3,068,484.)

3,117,332, Kelley and Dallman. ADJUSTABLE DOCKBOARD; **3,137,017,** Pfleger and Ramer, same; **3,203,002,** G. McGuire, ADJUSTABLE DOCKBOARD WITH COUNTERBALANCING EXTENSION LIP; **Re. 25,249,** G. P. Kelley, ADJUSTABLE DOCKBOARD; **filed** Oct. 18, 1972, D.C., N.D. Tex. (Dallas), Doc. CA-3-6400-C, *Kelley Company, Inc.* v. *Overhead Door Corporation.*

3,137,017. (See 3,117,332.)

3,203,002. (See 3,117,332.)

3,260,508, E. R. Powell, BALANCING HOIST, **filed** Mar. 31, 1972, D.C., E.D. Mich. (Detroit), Doc. 38085, *D. W. Zimmerman Mfg., Inc.* v. *William H. Hash Co., Inc.* Stipulation and order of dismissal signed by the Honorable Charles Joiner on Oct. 19, 1972.

3,396,342, A. E. Feinberg, POWER SUPPLY CIRCUIT FOR CONTINUOUS WAVE MAGNETRON OPERATED BY PULSED DIRECT CURRENT, **filed** Oct. 12, 1972, D.C., N.D. Ill. (Chicago), Doc. 72c2555, *Advance Transformer Co.* v. *Sears, Roebuck and Co.*

3,404,494, H. D. Wolfe, THEATRE AND STAGE CONSTRUCTION, **filed** June 23, 1972, D.C., W.D. Va. (Roanoke), Doc. 72-C-86-R, *Howard D. Wolfe* v. *Samuel Belkin.* Voluntary dismissal pursuant to Rule 41(a) of the Federal Rules of Civil Procedure, Oct. 24, 1972.

3,416,659, Linderman and Gibson, CAN TESTING, **filed** Nov. 30, 1971, D.C., D.C., Doc. 3474-69, *Reynolds Metals Co.* v. *Linderman Engineering Company, Inc. et al.* Ordered defendant shall grant royalty free, non-exclusive license to plaintiff, Nov. 30, 1971.

3,436,530, Faude, Haller, Hengstler, CONTROL DEVICE, **filed** Sept. 5, 1972, D.C. Conn. (New Haven), Doc. 15289, *Veeder Industries, Inc.* v. *Hecon Corporation.*

3,532,390, R. C. Bueler, CONTROL VALVE, **filed** Oct. 16, 1972, D.C., W.D. Mich. (Kalamazoo), Doc. K109-72CA-8, *Wagner Electric Corporation* v. *The Bendix Corporation.*

3,533,407, G. I. Smith, STRAP TYPE WRIST SUPPORT, **filed** Sept. 17, 1971, D.C., N.D. Ohio (Cleveland), Doc. C-71-911, *King Louie International, Inc.* v. *House of Champions Research.* Order permanently enjoining defendants from infringing; parties have settled their differences out of court, Oct. 17, 1972.

3,576,661. (See 2,911,729.)

3,661,220, C. R. Harris, **WEIGHING DEVICE FOR LOGGING TRUCKS OR THE LIKE, filed** Sept. 20, 1972, D.C., W.D. Wash. (Seattle), Doc. 609–72C2, *Electro Development Corporation* v. *Structural Instrumentation Inc., and Measurement Systems, Inc.*

3,672,969, Novel and Ostrow, **ELECTRODEPOSITION OF GOLD AND GOLD ALLOYS, filed** Oct. 13, 1972, D.C. Mass. (Boston), Doc. 72–3165A–C, *Lea-Ronal, Inc.* v. *Auric Corporation.*

Re. 25,249. (See 3,117,332.)

Re. 26,096, F. A. Lambach, **FISHING FLOAT, filed** Oct. 16, 1972, D.C., M.D. Pa. (Scranton), Doc. 72–526, *Plastilite Corporation* v. *Kassnar Imports.*

D. 221,718, P. Kates, **UMBRELLA, filed** May 16, 1972, D.C., S.D.N.Y., Doc. 72–C–2087, *Giant Umbrella Co. Inc.* v. *Kanematsu-Gotshu, Inc.* **Same, filed** May 16, 1972, D.C., S.D.N.Y., Doc. 72–C–2088, *Giant Umbrella Co. Inc.* v. *Kinsko-Mataicki Corp.* **Same, filed** May 16, 1972, D.C., S.D.N.Y., Doc. 72–C–2089; *Giant Umbrella Co. Inc.* v. *New York Sankyo Seiko Co. Ltd.* **Same, filed** May 16, 1972, D.C., S.D.N.Y., Doc. 72–C–2090, *Giant Umbrella Co. Inc.* v. *C. Itoh and Co. (America, Inc.).* **Same, filed** May 16, 1972, D.C., S.D.N.Y., Doc. 72–C–2091, *Giant Umbrella Co. Inc.* v. *Okuda Co. New York Inc.* **Same, filed** May 16, 1972, D.C., S.D.N.Y., Doc. 72–C–2092, *Giant Umbrella Co. Inc.* v. *Toshoku America, Inc.*

D. 222,995. (See 2,899,242.)

Certificates of Correction for the Week of Mar. 20, 1973

Re. 27,370	3,654,246	3,680,230	3,687,999
Re. 27,388	3,654,557	3,680,391	3,688,181
Re. 27,400	3,657,024	3,680,396	3,688,502
D. 223,773	3,657,918	3,680,863	3,688,542
3,260,691	3,658,370	3,681,324	3,688,683
3,284,611	3,658,711	3,681,334	3,688,993
3,445,938	3,659,286	3,681,467	3,689,831
3,446,604	3,660,317	3,682,191	3,690,054
3,588,889	3,662,671	3,682,277	3,690,284
3,591,897	3,663,079	3,682,540	3,690,297
3,593,337	3,663,647	3,682,973	3,690,388
3,598,006	3,664,255	3,682,975	3,690,809
3,603,354	3,664,523	3,683,144	3,690,823
3,607,332	3,665,902	3,683,246	3,690,835
3,607,686	3,666,734	3,683,592	3,691,401
3,607,755	3,667,890	3,683,944	3,691,674
3,611,061	3,668,241	3,683,990	3,692,550
3,612,841	3,668,910	3,684,002	3,692,669
3,612,883	3,669,755	3,684,096	3,692,768
3,615,585	3,670,257	3,684,152	3,694,197
3,619,219	3,670,317	3,684,258	3,694,693
3,622,283	3,671,931	3,684,385	3,695,874
3,622,795	3,673,801	3,684,568	3,695,900
3,635,912	3,674,247	3,684,893	3,696,367
3,637,075	3,676,215	3,686,012	3,697,030
3,637,589	3,676,685	3,686,258	3,698,073
3,638,169	3,677,149	3,686,314	3,698,431
3,642,057	3,677,268	3,686,622	3,698,620
3,648,227	3,677,570	3,686,865	3,699,588
3,648,244	3,678,503	3,687,138	3,699,719
3,648,899	3,679,114	3,687,257	3,700,168
3,649,190	3,679,339	3,687,418	3,700,228
3,650,103	3,679,494	3,687,743	3,700,301
3,653,290	3,679,596	3,687,917	3,701,134
3,654,172	3,680,053	3,687,985	3,701,299

Erratum

All reference to Patent Number 3,716,607 to Sugio Otani, Heat Treatment of Molten Carbonaceous Material Prior to its conversion to Carbon Fibers and other shapes, appearing in the OFFICIAL GAZETTE of February 13, 1973, should be deleted as the application inadvertently issued.

PATENT EXAMINING CORPS

R. A. WAHL, Assistant Commissioner
WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF MARCH 6, 1973

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	12-16-71
GENERAL ORGANIC CHEMISTRY, GROUP 120—I. MARCUS, Director. Heterocyclic; Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	1-03-72
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—L. J. BERCOVITZ, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	11-16-71
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. P. KENT, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	12-01-71
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. FRIEDMAN, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	11-02-71
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—N. ANSHER, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	7-18-72
SPECIAL LAWS ADMINISTRATION, GROUP 220—R. L. CAMPBELL, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	5-31-72
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	4-19-72
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—L. FORMAN, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	12-15-71
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—W. L. CARLSON, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	1-04-72
DESIGNS, GROUP 290—R. L. CAMPBELL, Director. Industrial Arts; Household, Personal and Fine Arts.	5-26-71
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—A. BERLIN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	3-17-72
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus: Plastics Working Apparatus: Plastic Block and Earthenware Apparatus: Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	1-03-72
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—A. RUEGG, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	4-10-72
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—M. M. NEWMAN, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	3-06-72
MISCELLANEOUS CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—T. J. HICKEY, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	1-03-72

Expiration of patents: The patents within the range of numbers indicated below expire during March 1973, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,736,898 to 2,740,116, inclusive
Plant Patents..... Numbers 1,457 to 1,466, inclusive

REISSUES

MARCH 20, 1973

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

27,601
NOVEL WATER-REPELLENT COMPOSITIONS

Jacob M. Fain, Bay Harbor Islands, Fla., and Edward McDonnell, Brooklyn, N.Y., assignors to William L. Alexander, William G. Mulligan, and Foster Dee Snell, trustees for the stockholders of Twenty-Nine West Fifteenth Street Corporation

No Drawing. Original No. 3,433,750, dated Mar. 18, 1969, Ser. No. 521,504, Jan. 19, 1966. Application for reissue Dec. 30, 1971, Ser. No. 214,492

Int. Cl. C08g *33/20*

U.S. Cl. 260—2 S **10 Claims**

Water repellent compositions comprised of a silico-titanium copolymer and a cationic, surface-active quaternary ammonium compound and to a method of forming transparent water-repellent films on the surface of transparent solids during rain.

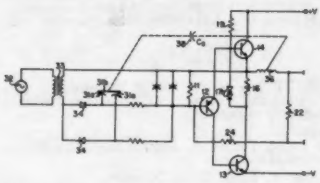
27,602
AMPLIFIER WITH FLOATING INPUT

Melvin O. Eide, Bellevue, Wash., assignor to United Control Corporation, Redmond, Wash.

Original No. 3,482,175, dated Dec. 2, 1969, Ser. No. 718,797, Apr. 4, 1968. Application for reissue Nov. 9, 1970, Ser. No. 87,964

Int. Cl. H03f *3/04*

U.S. Cl. 33—24 **17 Claims**



An amplifier has an input floating with respect to ground and employs a resistor which is connected across the base-emitter junctions of two transistors in the amplifier. By matching the characteristics of the transistors, their base-emitter junction drops can be substantially equal so that the voltage drop across the input resistor is near zero. The potential of the floating input follows the output potential so that an input device or element may be maintained at the same potential as an output device.

27,603
PROCESS OF PRODUCING AN ELECTRICAL RESISTOR

Anthony J. Stankavich, Syracuse, N.Y., assignor to Carrier Corp., Syracuse, N.Y.

Original No. 3,619,287, dated Nov. 9, 1971, Ser. No. 761,184, Sept. 20, 1968. Application for reissue Dec. 8, 1971, Ser. No. 205,863

Int. Cl. B44d *1/18;* **C23c** *17/00*

U.S. Cl. 117—227 **3 Claims**

An electrical resistance element particularly adapted for use in precision potentiometers and related applications wherein the high temperature resistant and essentially electrically non-conductive base has fused thereon a resistance material comprised of powdered glass and metal resinate suitably treated and admixed with precious metal powders with which in the mixing process is combined an organic vehicle preferably provided by ethyl cellulose dissolved in an alcohol exemplified by 1-undecanol or 1-decanol or equivalents thereof. The instant invention as applied to a ceramic substrate assures uniformly successful results in the printing process, and among other advantages contributes significantly to increased shelf life for the material being applied.

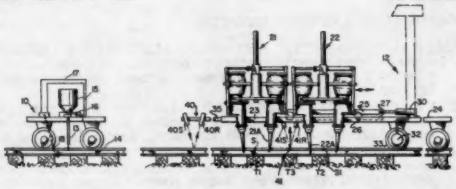
27,604
WORKHEAD POSITIONING MEANS

John Kenneth Stewart and Helmuth Rolf Erich von Beckmann, Columbia, S.C., assignors to Canron Limited-Canron Limitee

Original No. 3,504,635, dated Apr. 7, 1970, Ser. No. 698,001, Jan. 15, 1968. Application for reissue May 10, 1971, Ser. No. 142,083

Int. Cl. E01b *27/16*

U.S. Cl. 104—12 **8 Claims**



A railway track tamping machine having a fixed tamping head mounted on the chassis of the machine and a second tamping head mounted on the chassis of the machine behind the fixed tamping head and movable longitudinally of the chassis relative to the fixed tamping head, is provided with a detector which detects a first index on the track related to a first tie to be tamped and initiates a control means to control the forward travel of the vehicle to position the fixed head over the first tie to be tamped; and a second detector which detects a second index related to a second tie to be tamped and initiates a control means to actuate a motor on the vehicle to move the second tamping head on the chassis relative to the first tamping head to position the second tamping head over the second tie to be tamped.

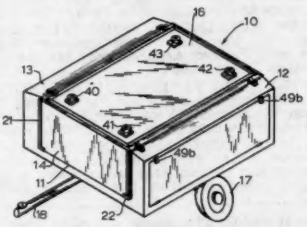
27,605
VEHICULAR TOWED CAMPING TRAILER

Neill M. Laney, 2430 Medway Drive, Raleigh, N.C. 27608

Original No. 3,549,196, dated Dec. 22, 1970, Ser. No. 805,165, Mar. 7, 1969. Application for reissue June 23, 1971, Ser. No. 156,142

Int. Cl. B60p *3/32*

U.S. Cl. 296—23 R **7 Claims**



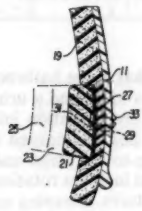
A vehicular towed camping trailer provides a covered compartment for hauling camping gear and employs removable end gates which can be converted into tables and a removable cushioned top which can be converted into a cushioned bed.

PATENTS

GRANTED MARCH 20, 1973

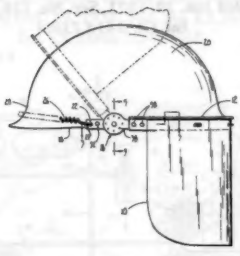
GENERAL AND MECHANICAL

3,720,955
FOOTBALL HELMET
John H. Rawlings, Ava, Mich., assignor to Questor Corporation, Toledo, Ohio
Filed Nov. 26, 1971, Ser. No. 202,220
Int. Cl. A42b *3/00*
U.S. Cl. 2—3 R **4 Claims**



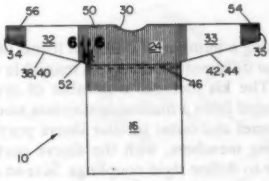
A contour adjusting device for a football helmet having an elongated channel in the rear padding of the helmet located substantially adjacent the nape of the neck of the wearer. A resilient pad of a selectively predetermined depth and of a dimension to fit within the elongated channel is secured within the channel and extends outwardly therefrom. The use of different depth pads adjusts the rear of the helmet to provide a snug fit against the nape of the neck.

3,720,956
FACE SHIELD
Herbert A. Raschke, Greenbrae, Calif., assignor to E. D. Bullard Company, Sausalito, Calif.
Filed May 19, 1971, Ser. No. 146,578
Int. Cl. A42b *1/00*
U.S. Cl. 2—8 **2 Claims**



A detent joint for pivotally securing a face shield holder to a stationary head gear. The joint is constructed of a pair of identical resilient discs secured to the holder and the head gear, respectively, pivotable about a common pin, and firmly held in mutual contact by thrust shoulders of the pin. The discs include a plurality of coacting detents that are equally spaced from each other and from the pivot axis so that upon pivotal movement of the face shield holder the detent and depressions intermittently register and maintain the face shield in a plurality of angularly spaced positions.

3,720,957
CONFORMABLE DISPOSABLE GARMENT
Donald Patience, Barrington, Ill., assignor to The Kendall Company, Boston, Mass.
Filed Feb. 14, 1972, Ser. No. 225,847
Int. Cl. A41b *9/00;* **A61b** *19/06*
U.S. Cl. 2—114 **5 Claims**

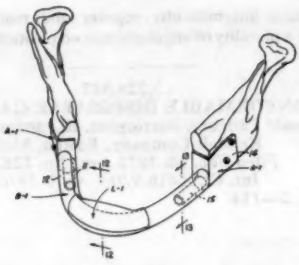


A disposable garment such as an operating room gown is made of flexible inelastic nonwoven material, composed of generally planar sections joined by seams, selected portions of the material being micropleated by mechanical compression of the material to form a multiplicity of random discontinuous micropleats extending transversely to the direction of the compression to compact the material in said direction to form a conformable portion irreversibly size-adjustable to a larger size along said direction, whereby the garment is adapted to conform to a wearer's form and size.

3,720,958
NECKTIE AND METHOD OF MAKING SAME
Roy M. Cowdrey, Cranford, N.J., assignor to The Singer Comapny, New York, N.Y.
Filed Aug. 26, 1971, Ser. No. 175,308
Int. Cl. A41d *25/06*
U.S. Cl. 2—146 **6 Claims**

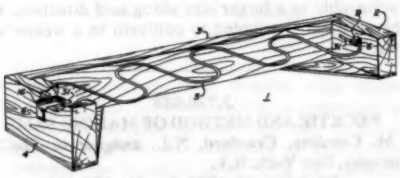
A necktie and the method of fabricating the necktie using only lines of stitches capable of being produced on a conventional household sewing machine and without requiring eversion of the necktie. Easily removed basting stitches are used temporarily to hold parts of the necktie in position to be finally united by a zigzag pattern of stitches.

3,720,959
MANDIBULAR PROSTHETIC APPARATUS
George W. Hahn, 1605 Pentagon Parkway, Dallas, Tex.
Filed Aug. 26, 1970, Ser. No. 67,029
Int. Cl. A61f 1/24
U.S. Cl. 3—1 12 Claims



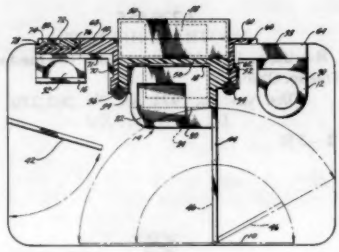
A kit for forming a number of different forms of prosthetic devices to replace different portions of a mandible which have been removed. The kit includes a number of prefabricated members, fabricated from a malleable stainless steel mesh, including mating inner and outer tubular sleeve portions for assembling adjoining members, with the sleeve portions being crimped together to define rigid couplings. Screws are used to attach the end member of an assembled prosthetic device to the bone stump of the remaining mandible.

3,720,960
SPRING ATTACHMENT CLIP
John J. Bond, P.O. Box 19, Wickenburg, Ariz. 85358
Filed May 21, 1971, Ser. No. 145,748
Int. Cl. A47c 23/02
U.S. Cl. 5—259 R 9 Claims



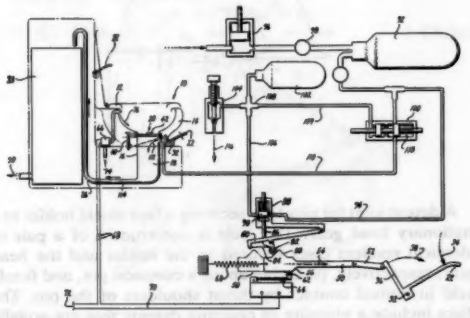
A device which provides an inexpensive and rapid means for suspending springs within a framework. The device, in its simplest form, comprises a flat strip of sheet metal having one end bent upwardly in an arced configuration. At the end opposite thereto a portion of the strip is bent downwardly at an angle of 90° to form a flange and the end dependent therefrom is bent at an angle of 90° such that the latter portion is essentially parallel to the main body of the strip. If desired, the end portion may be pointed or notched to provide two or more pointed ends. In operation, the pointed end is hammered into the outside of the frame with the main part of the strip resting on the frame. Thusly, the arced end points toward the interior of the frame and the spring to be suspended within the frame is hooked within the arced portion. The clip provides vertical support of a cantilever type due to the main part of the strip resting on the frame and lateral support due to the pointed ends being anchored to the frame. The longitudinal force exerted by the spring is countered by the first 90° bend acting as a flange against the frame itself.

3,720,961
SELF-CLEANING RESTROOM
Glenwood L. Garvey, 10998 Strathmore, Los Angeles, Calif. 90024
Filed July 26, 1971, Ser. No. 166,037
Int. Cl. A47k 17/00; E03d 11/12
U.S. Cl. 4—1 20 Claims



An enclosed room has three bathroom fixtures in it: a lavatory and counter, a toilet and a urinal. The urinal and toilet are each carried by a rotation joint or hinge for rotation into a cleaning position nestled below the lavatory and counter. Plumbing to the toilet and urinal is through their rotation joints and includes rotational plumbing joints to swing with these fixtures. Cleaning spray heads beneath the lavatory and counter are positioned to direct cleaning solution into the urinal basin and onto the toilet. Cleaning spray heads behind the toilet are positioned when the toilet is in its cleaning position to direct cleaning solution onto the under surface of the urinal basin. Rotatable panels carried by the rotation joints of the toilet and urinal close upon themselves when the urinal and toilet and rotated into their cleaning position to define a cleaning cabinet for all three fixtures. Additional nozzles within the cabinet clean the walls, a mirror and the floor during the cleaning operation. Outside the cabinet, the walls of the enclosed room are conveniently cleaned with additional spray heads without being encumbered by the urinal and toilet. The cleaning equipment is self-contained in a support package. Circulated hot air dries the cleaned fixtures and walls of the restroom.

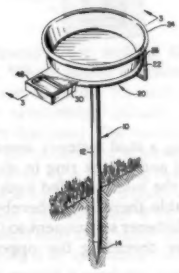
3,720,962
FLUSH TOILET AND METHOD
Robert E. Harrah, Willits, Calif., assignor to Microphor, Inc., Willits, Calif.
Filed Jan. 29, 1971, Ser. No. 110,929
Int. Cl. A41d 13/04
U.S. Cl. 4—52 11 Claims



A system (apparatus and method) for reducing the amount of water required for flushing conventional and portable

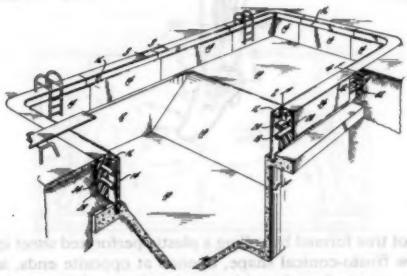
toilets. The system makes use in a toilet combination of a bowl portion and a gas-tight base portion and employs water flush means for the bowl portion in conjunction with air flush means for the base portion. Movable valve means between the bowl and base portions are controlled to retract while water is introduced to flush the bowl portion and to return while a charge of compressed air is introduced to discharge the contents of the toilet to a waste discharge line. This system is effective in conjunction with conventional toilets or waste treating systems or compact biological or chemical waste treating systems.

3,720,963
PORTABLE WASHING STAND
Roman Zakaski, Charleston, W. Va., assignor to Monty Enterprises, Inc.
Filed March 19, 1971, Ser. No. 125,933
Int. Cl. A47k *1/04*
U.S. Cl. 4—167 **8 Claims**



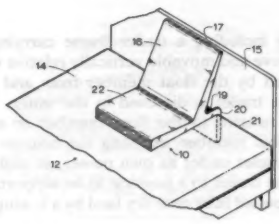
A portable washing stand having a ground penetrating standard removably supporting on its upper end a circular plate by means of an interfitting locking and stabilizing arrangement with the plate providing a secure seat for a wash basin and having diametrically opposing radially extending peripheral projections, one of which removably supports a swivel mounted towel ring and the other of which provides a support for a detachable soap dish.

3,720,964
PREFABRICATED SWIMMING POOLS
David P. Thomson, Chicago, Ill., assignor to Chicago Swimming Pool Manufacturing Inc., Maywood, Ill.
Filed Oct. 19, 1970, Ser. No. 82,204
Int. Cl. E04h *3/16, 3/18*
U.S. Cl. 4—172.19 **17 Claims**



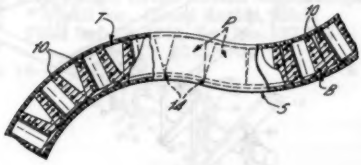
Fiberglass reinforced plastic swimming pools and prefabricated pool walls are illustrated. In one embodiment, the pools and walls contain liquid conveying conduits which are supported by a conduit supporting material such as a rigid polyurethane foam which is secured to the fiberglass reinforced plastic. Pools and walls with integrally molded roll-over gutters are also illustrated as is a method for forming a liquid tight seal around a metal fitting positioned in a panel of fiberglass reinforced plastic. The latter is accomplished by providing the metal fitting with a plastic adaptor and surrounding the adaptor over a portion of its length with fiberglass reinforced plastic.

3,720,965
BACK SUPPORT
Harry Walter Wright, 6 Wetherby, Scarborough, Ontario, Canada
Filed July 23, 1971, Ser. No. 165,452
Int. Cl. A47c *21/00*
U.S. Cl. 5—327 B **2 Claims**



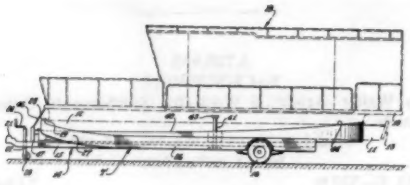
A back support for use with a bed having a headboard, in which a back member has an upper edge adapted to bear against the headboard and a lower edge carrying a rearwardly extending arm having a flange adapted to bear against the mattress or frame of the bed. A seat may extend forwardly from the lower edge of the back member.

3,720,966
SPRING UPHOLSTERY CUSHIONING
Milton Zysman, 54 Glen Road, Toronto, Ontario, Canada
Continuation-in-part of Ser. No. 30,890, April 22, 1970. This application Oct. 1, 1971, Ser. No. 185,508
Int. Cl. A47c *27/22, 7/20*
U.S. Cl. 5—353 **6 Claims**



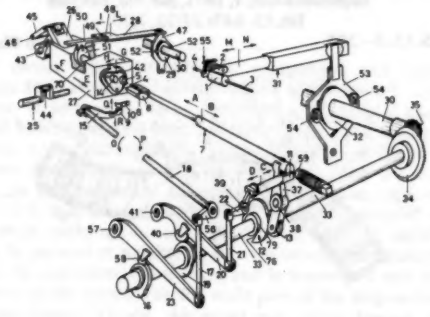
A pocket spring upholstery cushioning comprised of helical springs respectively encapsulated in a pod of flexible foam plastic and all mutually interconnected in co-planar, side by side assembly by an integral web of the same material. Said web has a thickness of less than the axial heights of the pods and connects them by their ends on one side only of the cushioning permitting independent relative movement of the spring ends on the other side of the cushioning.

3,720,967
BOAT TRAILER
Henry T. M. Rice, 1213 Ramona Street, San Gabriel, Calif.
Filed Feb. 16, 1971, Ser. No. 115,295
Int. Cl. B63c *13/00*
U.S. Cl. 9—1 T **14 Claims**



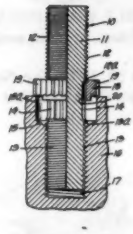
A boat trailer including a trailer frame carrying a float member thereabove and movable vertically relative thereto, a boat being guided by the float member from and onto the trailer. When the trailer is disposed in the water, its frame drops vertically relative to the float member to an extent limited by the float member, enabling the boat to back off freely from the trailer under its own power, as well as move forwardly over the trailer to a position to be supported by the trailer when it is pulled fully onto dry land by a towing vehicle.

3,720,968
MACHINE FOR THE PRODUCTION OF HALF-PUNCHED RIVETS
Eufemia Garlaschi, Via Mengoni, 4 Milan, Italy
Continuation-in-part of Ser. No. 812,715, April 2, 1969, abandoned. This application Jan. 8, 1971, Ser. No. 105,050
Claims priority, application Italy, April 6, 1968, 14924 A/68
Int. Cl. B21k *1/60*
U.S. Cl. 10—11 A **2 Claims**



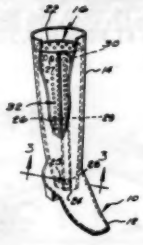
A machine is disclosed for the formation of half-punched rivets as a continuous operation, using an endless wire as the starting material. The rivet-forming wire sections are sequentially severed from the endless wire, pushed through a die, punched and headed, means being provided to withdraw the finished rivets from the die, and means being provided to permit the size of the produced rivets to be easily and readily varied.

3,720,969
METHOD OF MAKING A STUD FASTENER ASSEMBLY WITH INTEGRAL LOCK
Jose Rosan, Sr., San Juan Capistrano, and Jose Rosan, Jr., Newport Beach, both of Calif., assignors to Rosan Engineering Corp., Newport Beach, Calif., by said Rosan
Division of Ser. No. 32,081, April 27, 1970, Pat. No. 3,630,252. This application Sept. 23, 1971, Ser. No. 182,944
Int. Cl. B21k *1/44*
U.S. Cl. 10—27 R **5 Claims**



A method of making a stud fastener assembly having both ends thereof threaded and a lock ring in slidable but captive engagement between the said threaded ends so that said lock ring is not disengageable therefrom whereby the lock ring is slipped onto the stud fastener subsequent to threading one end thereof and thereafter threading the opposite end of said fastener.

3,720,970
BOOT TREE
Evelyn J. Lutz, 205 Park Avenue, Holly, Mich.
Filed April 15, 1971, Ser. No. 134,151
Int. Cl. A43d *5/00*
U.S. Cl. 12—114.6 **10 Claims**



A boot tree formed by rolling a plastic perforated sheet into a hollow frusto-conical shape, opened at opposite ends, and including means for releasably securing the overlying portions of the rolled plastic sheet such that the frusto-conical shape of the rolled sheet may be selectively varied to permit the insertion of the boot tree into boot legs of various sizes. The boot tree may be unfolded and flattened for easy storage.

3,720,971
SHOE MAKING

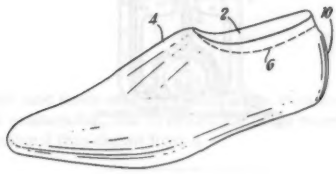
Keith Gordon Wyness; Alan Roy Dodd, both of Norfolk; John Nigel Dixon Spinks, London, and Kevin David Nicholas Kearney, Woking, all of England, assignors to The Shoe and Allied Trades Research Associated, Kettering, Northamptonshire, England

Filed Nov. 18, 1970, Ser. No. 90,770

Claims priority, application Great Britain, Nov. 20, 1969, 56,929/69

Int. Cl. A43d

U.S. Cl. 12—146 C **18 Claims**



Methods and apparatus for making shaped upper components for a shoe, Whole upper components or upper part upper components can be made. Vacuum and pressure forming techniques for conforming initially flat material to a moulding surface are disclosed. The moulding surfaces may be of a shape whereby the preformed upper is convertible to the shape of the last merely by a bending operation. The mould shape can be arrived at by forming a sheet of resiliently bendable material such as unplasticized PVC to the last shape required to form a shell and, after removing the shell from the last, partially flattening it by spreading outwardly the opposite sides. Where a male mould is used the surface of the material which is to be the outside surface of the shoe can be in contact with the mould surface, and the preformed upper would be turned inside out after removal from the mold; where a female mould is used the surface of the material which is to be inside the shoe may be in contact with the moulding surface and again the preformed upper would be turned inside out after removal from the mould. The moulding surface may be embossed to transfer a pattern to the upper material. The material is held during the moulding operation. A device for partially cutting out the upper from the sheet of material from which it is formed may be provided, which device may also operate as a clamp for holding the material during the forming operation.

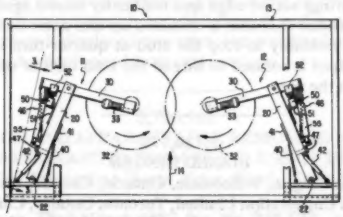
3,720,972
VEHICLE WRAP-AROUND CLEANING APPARATUS

George Thomas Ennis, 1354 East State Street, Sharon, Pa.

Filed Sept. 7, 1971, Ser. No. 178,191

Int. Cl. B60s *3/06*

U.S. Cl. 15—21 D **9 Claims**



A vehicle wrap-around rotary brush-type cleaning assembly having a first arm pivotally mounted at one side of the path of a vehicle and a second arm pivoted thereto carrying rotatable brush means at one end. Spring tensioning means connect the first arm to the frame and the second arm to the first arm to maintain the arms in a normal open position. A compression spring is positioned between the two arms to limit relative movement in one direction and urge the arms back to their normal position. A damping cylinder connected between the arms by a pin and slotted plate connection permits relative initial movement between the arms prior to any damping taking effect. The brush moves across the front, along the side and across the back of a vehicle. Two brush assemblies may be disposed directly opposite each other on each side of the path with the brushes in overlapping relation to clean both sides of a vehicle.

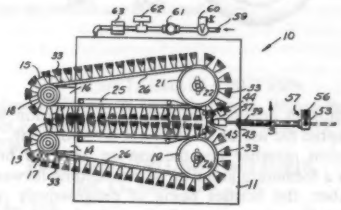
3,720,973
BRAIDED CABLE COVER REMOVING MACHINE

Stephen B. Bogese, Roanoke, Va., assignor to Virginia Plastics Company, Roanoke, Va.

Filed May 11, 1971, Ser. No. 142,308

Int. Cl. H02g *1/12*

U.S. Cl. 15—88 **10 Claims**



A machine for combing out the woven braid cover of an electric cable to permit connections to be made to the end of the cable with the metallic cover being wound into a single strand at the end for connection to a shielding or ground circuit. The machine includes opposed belts having a plurality of wire brush tufts secured thereto and with the tufts of the belts arranged in confronting relation. The cable with the woven metal braid thereon is inserted into the space between the belts so as to be contacted by the wire brush tufts which comb out the braid into individual strands. The end of the cable is inserted a pre-determined distance between the belts and is then pulled backwardly from between the belts with the desired amount of the woven cover combed into individual strands. The ends of the wire tufts are corrugated to facilitate the combing out action.

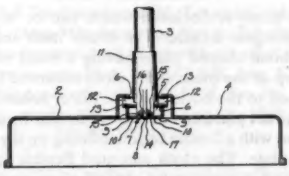
3,720,974
FLOOR SWEEPER HANDLE-TO-HOUSING CONNECTION

Henry J. Rosendall, Grand Rapids, Mich., assignor to Bissell Inc., Grand Rapids, Mich.

Filed Jan. 19, 1971, Ser. No. 107,754

Int. Cl. B25g *3/00*

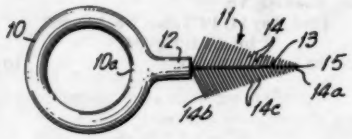
U.S. Cl. 15—144 R **6 Claims**



The housing of a carpet sweeper or the like has a recess in its top with a floor which is formed to act as a spring. The lower end portion of the sweeper handle

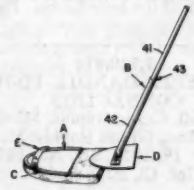
is mounted in bearings and is pivotable from an upright position to at least one horizontal position. The handle end engages the recess floor during pivoting, and the increased friction holds the handle and housing at a suitable angle.

3,720,975
TOOTHBRUSHES
Stanley E. Nelson, 200 Central Park, South, New York, N.Y.
Filed Feb. 12, 1971, Ser. No. 114,996
Int. Cl. A46b 3/00
U.S. Cl. 15—167 R **1 Claim**



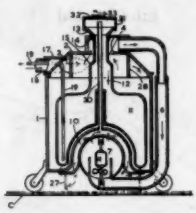
A toothbrush adapted for finger manipulation and especially adapted for use at the cervical areas of teeth. A finger-manipulation member has thereon an array of bristles arranged in a formation along an axis extending forwardly from the member, the bristles being of progressively increasing lengths in a direction rearwardly from the front or leading end of the array, the foremost bristles being proportioned for initial entry within the space at the cervical portions of two adjacent teeth, thereby to provide an opening wedge for entry of the longer bristles therebehind. The finger member is positioned at the rear end of the array of bristles, so that the direct push of an operatively positioned finger will be in the direction of the axis toward the plane of the teeth to be brushed.

3,720,976
BAYONET MOUNTED FLEXIBLE CLEANING PAD
Guy Bailey, Route 1, Box 3, Atlus, Okla.
Filed Feb. 8, 1971, Ser. No. 113,181
Int. Cl. A47l 13/18, 17/02
U.S. Cl. 15—244 A **4 Claims**



A toilet brush is disclosed which can be mounted to and from an elongate handle. The brush itself includes a hand sized parabolic shaped plate having a hand encircling strap over the top of the plate and a cloth mounted flexible sponge pad attached to the bottom of the plate. A handle with an attached bayonet plate can be moved to and from a position of engagement with a female bayonet fitting on the top portion of the brush plate. The cloth mounted flexible sponge pad extends beyond the parabolic shaped plate to provide an extended and flexible cleaning surface. This extended and flexible cleaning surface can both conform to and be backed by the human wrist when the brush is handle held as well as conformed to the irregular interior surfaces of a toilet bowl when the brush is handle held.

3,720,977
SUCTION CLEANING APPARATUS
Wladyslaw Brycki, 19 Mayfield Rd., Liverpool, England
Filed Feb. 16, 1971, Ser. No. 115,320
Claims priority, application Great Britain, March 25, 1970, 14,367/70
Int. Cl. A47l 7/00
U.S. Cl. 15—321 **1 Claim**



This invention relates to suction washing apparatus and has for its object to wash by suction the pile of carpets, surface of floor coverings, upholstery and other fabrics, and floor, windows and wall and even ceiling which in use is arranged to supply cleaning liquid to the surface to be cleaned and to remove same by suction means.

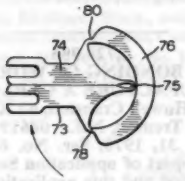
3,720,978
INDEXING FURNITURE GLIDE
Robert E. Miller, Jr., Bronxville, N.Y., and Anthony J. Balchunas, Rahway, N.J., assignors to Robert E. Miller & Co., Inc., New York, N.Y.
Filed Oct. 7, 1971, Ser. No. 187,335
Int. Cl. A47b 91/06
U.S. Cl. 16—42 **7 Claims**

A glide, adjustable axially in protruding relation to the hollow leg of an article of furniture, has indexing means comprising leaf springs set on edge and resiliently biased against flats on a foot-ended stud that is threaded up into a nut fixed in the leg, so as yieldably to stop the stud at quarter-turn intervals when the foot is rotated to thread the stud further up into or down from the nut.

3,720,979
BIASED HINGES
Alois A. Krawagna, Willowdale, Ontario, Canada, assignor to Western Corporation Limited, Toronto, Ontario, Canada
Continuation-in-part of Ser. No. 689,390, Dec. 11, 1967. This application June 17, 1968, Ser. No. 744,268
Int. Cl. E05d 7/00
U.S. Cl. 16—150 **5 Claims**

A snap-hinge in which two hinge members are hinged together about a first hinge line. A resilient connecting link is joined at one end integrally to one of the hinge members at a

second hinge line and is hinged at the other end to the other hinge member at a third hinge line. The connecting link is capable either of compression or of expansion as between its



two ends, and tends to maintain the hinge members in a given angular relationship, and to return the hinge members to that relationship if they depart from it.

3,720,980

PRESSING MACHINE FOR FORMING ELONGATED BODIES OF MEAT AND THE LIKE EDIBLE MATERIAL

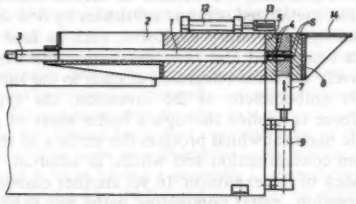
Hermann Walter Gehlen, Kaiserslautern, Upper Platine; Karl Hartmann, Bremerhaven-Speckenbuttel, and Gerhard Thieme, Kaiserslautern, Upper Palatine, all of Germany, assignors to Eisenwerke Kaiserslautern GmbH, Kaiserslautern/Pfalz, Germany

Filed Aug. 10, 1970, Ser. No. 62,454

Claims priority, application Germany, Aug. 9, 1969, P 19 40 724.1

Int. Cl. A22c 7/00

U.S. Cl. 17—32 **5 Claims**



A pressing machine for forming elongated bodies or portions of meat and the like edible material comprises an extrusion plate forming a wall of a compression chamber and being provided with at least one array of calibrated extrusion openings the cross-section of which corresponds to the cross-section of the bodies to be formed. A forming plate, having a thickness equal to the length of the bodies and being slidably mounted between the extrusion plate and a stationary guide plate, is provided with through-going passages of equal cross-section to and aligned with, in its operative position, the openings of the extrusion plate. Upon filling of the passages with compressed material extruded through said openings, the forming plate is displaced to a retracted position for the ejection of the bodies formed from said passages.

3,720,981

METHOD AND APPARATUS FOR REMOVING WORMS AND PARASITES FROM THE FLESH OF FISH

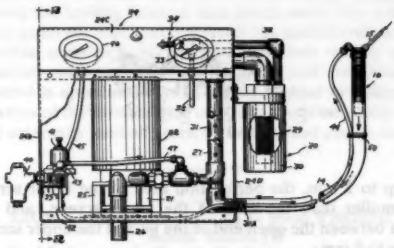
Joseph M. Schmader, Hunts Point Road, Cape Elizabeth, Maine

Filed May 4, 1972, Ser. No. 250,179

Int. Cl. A22b 3/00

U.S. Cl. 17—45 **19 Claims**

The invention is concerned with the removal of such objects as worms and parasites from the flesh of a fish after it has been cleaned and so prepared that it is sufficiently translucent to enable any such objects to be observed when the thus prepared fish is held against a light source of predetermined minimum intensity. The sharpened end of a cannula is inserted in the flesh in a position to expose the object which is then



sucked therefrom and discharged into a collector. The vacuum is regulated to be within a predetermined range. Both method and apparatus are disclosed.

3,720,982

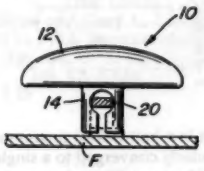
QUICK DETACHABLE BUTTON

Julia S. Myers, 170 North Franklin Street, Wilkes-Barre, Pa., and Paul F. Wilber, 1950 58th Ave., N., Apt. R-3, St. Petersburg, Fla.

Filed April 7, 1971, Ser. No. 131,918

Int. Cl. A44b 1/28, 1/38

U.S. Cl. 24—104 **3 Claims**



A button with a plastic shank is removably secured to a fastener bar that is sewed or riveted to a garment. The shank of the button has a transverse slit in it of the same thickness as the thickness of the fastener bar; and this slit terminates in a hole just below the head of the button which is of the same diameter as the width of the fastener bar. The button can be mounted on the fastener bar by slipping the slit in its shank over the fastener bar and then turning the button so that the bar enters and engages in the hole in the shank. To remove the button from the bar it is first turned to have the fastener bar aligned with the slit in the button shank, and then the shank is slid off the fastener bar.

3,720,983

APPARATUS FOR THE MANUFACTURE OF CRIMPED BULKY FILAMENTS

Hazime Hino, 5-5 Tominosato-machi, Takatsuki-shi; Tsutomu Nakamura, 1, Oaza Minohara, and Nobuo Takahashi, 5-18, 4-chome, Shimohozumi, both of Ibaraki-shi, all of Japan

Continuation-in-part of Ser. No. 847,548, Aug. 5, 1969, abandoned. This application Oct. 29, 1971, Ser. No. 193,790

Claims priority, application Japan, Aug. 6, 1968, 43/56053

Int. Cl. D02g 1/16

U.S. Cl. 28—1.4 **4 Claims**

In an apparatus for preparing crimped bulky filaments from continuous non-crimped filaments having a total denier of 40 – 5,000 using a moving screen and a jet stream of a temperature higher than 200° C. and a pressure of 3–12 kg/cm² gauge, which impinges on the screen accompanying the filaments, at a filament feeding rate of at least 250 m/min and $(x) = D \times R$

is at least 60,000 de.meter/min, the improvement in that the screen is an assembly screen having a perforation ratio of 20 – 60 percent, the distance between the upper and lower screens

being up to 2 mm, the perforation area of the lower screen being smaller than the area of the upper screen, and the distance between the open end of the jet and the upper screen being up to 3 mm.

3,720,984

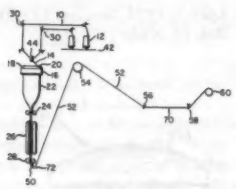
MULTI-END KNIT-DEKNIT PROCESS

Elbert Belmont Roberson, Jr., Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 6, 1971, Ser. No. 104,219

Int. Cl. D04b *19/00*

U.S. Cl. 28—72.16 **3 Claims**



An improvement in a knit-deknit process wherein a plurality of yarns are angularly converged to a single bundle which is knit into tubing and heat-set. The tube is maintained in a twistless state while being unraveled and the unraveled bundle is separated and taken up as separate yarns.

3,720,985

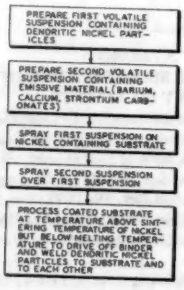
METHOD OF IMPROVING ADHERENCE OF EMISSIVE MATERIAL IN THERMIONIC CATHODES

William E. Buescher, Emporium, Pa., assignor to GTE Sylvania Incorporated, Seneca Falls, N.Y.

Filed June 30, 1971, Ser. No. 158,578

Int. Cl. H01j *9/00*

U.S. Cl. 29—25.17 **6 Claims**


PREPARE FIRST VOLATILE SUSPENSION CONTAINING DENDRITIC NICKEL PARTICLES
PREPARE SECOND VOLATILE SUSPENSION CONTAINING EMISSIVE MATERIAL (BARIUM, CALCIUM, STRONTIUM CARBONATES)
SPRAY FIRST SUSPENSION ON NICKEL CONTAINING SUBSTRATE
SPRAY SECOND SUSPENSION OVER FIRST SUSPENSION
PROCESS COATED SUBSTRATE AT TEMPERATURE ABOVE SINTERING TEMPERATURE OF NICKEL BUT BELOW MELTING TEMPERATURE TO DRIVE OFF BINDER AND WELD DENDRITIC NICKEL PARTICLES TO SUBSTRATE AND TO EACH OTHER

An application of dendritic nickel particles to a nickel containing cathode substrate to form a porous nickel is filled with potentially emissive material in one or more alternate spray passes. The nickel particles are welded to the substrate and to each other at the time the cathode is activated at a temperature in excess of the sintering temperature but below the melting temperature of the nickel particles. The procedure eliminates a separate sintering step and provides excellent adherence of the emissive material, thus reducing many arcing problems in high voltage applications.

3,720,986

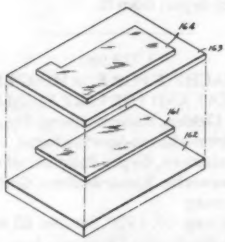
EXPLOSIVE BONDING OF WORKPIECES TO MANUFACTURE A CAPACITOR

Benjamin Howell Cranston, 67 Kuser Road, Trenton, N.J. 08619

Application Aug. 31, 1970, Ser. No. 68,431, which is a continuation-in-part of application Ser. No. 6,829, Jan. 29, 1970. Divided and this application Nov. 26, 1971, Ser. No. 202,347

Int. Cl. H01g *13/00*

U.S. Cl. 29—25.42 **15 Claims**



First workpieces, for example, beam-leaded integrated circuits, and the like, are bonded to second workpieces, for example, metallized ceramic substrates by first depositing a quantity of primary explosive, such as lead azide, onto each beam lead and then detonating the explosive to explosively bond the integrated circuits to the substrate. In another embodiment of the invention, the explosive bonding force is applied through a buffer sheet of plastic or metallic material which protects the surface of the substrate from contamination and which, in addition, dampens the shock of the explosion. In yet another embodiment of the invention, metal conductive paths are explosively bonded directly to a ceramic or glass substrate to form a "printed circuit pattern." The same techniques are used to manufacture resistors, capacitors, inductors, etc.

3,720,987

PROCESS FOR THE MANUFACTURE OF SLEWING RINGS OR BEARING ASSEMBLIES

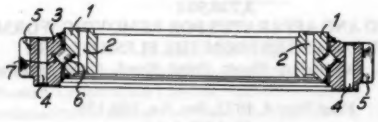
Jacques Leon Francois Dubost, Ville D'Avary, France, assignor to R. K. S., Avallon(Yonne), France

Filed Feb. 17, 1971, Ser. No. 116,141

Claims priority, application France, Feb. 20, 1970, 7006121

Int. Cl. B21h *1/12*; B21d *53/10*; B23p *17/00*

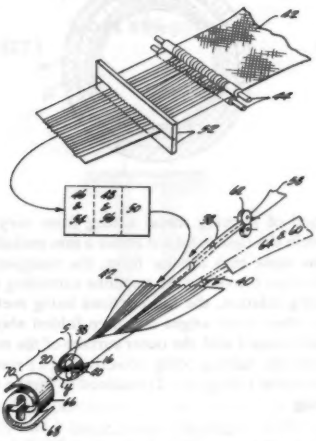
U.S. Cl. 29—148.4 R **5 Claims**



A process for manufacturing slewing rings or bearings-rings by centrifugally casting steel to cause the migration of iron particles toward the exterior region of the casting and carbon particles toward the interior region of the casting, and sub-

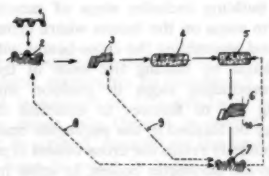
sequently, quenching the casting to produce a higher degree of hardness to its' internal region relative to its' external region and a higher degree of toughness to its' external region relative to its' internal region.

3,720,988
METHOD OF MAKING A HEAT PIPE
Elmer Dale Waters, Richland, Wash., assignor to McDonnell Douglas Corporation, Santa Monica, Calif.
Filed Sept. 20, 1971, Ser. No. 182,038
Int. Cl. B21d *53/02*
U.S. Cl. 29—157.3 R **7 Claims**



A heat pipe wick structure including a homogenous central wick is fabricated by forming a plurality of laterally disposed longitudinal pleats in a sheet of wire screen, and compressing the formed pleats laterally together and inserting the same longitudinally into a tubular container of a heat pipe. The plates can be formed in a laterally central portion of the sheet with a flat screen portion on each side thereof, and the side portions are turned back over opposite sides of the formed central wick to serve as wall screens in the tubular container. Reservoir screens having a generally U-shaped cross section normally engaged by the formed pleats can be additionally installed on both side of the central wick in the tubular container.

3,720,989
GEAR CUTTING METHODS
Pierre A. Ramond, Billancourt, France, assignor to Regie Nationale des Usines Renault, Billancourt, France
Filed May 25, 1970, Ser. No. 39,969
Int. Cl. B21d *53/28*; B21h *5/00*; B21k *1/30*; B23p *15/14*; B29d
U.S. Cl. 29—159.2 **11 Claims**

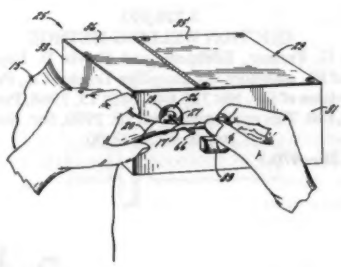


Method of manufacturing teeth, notably of gearings having their outline cut integrally by means of a pinion-tool, wherein an apparent outline of theoretical pinion-tool for different states of wear of said tool is calculated from the outline of the desired workpieces and of its generating rack ; from the surfaces of the teeth of the theoretical pinion-tool a theoretical hob is calculated for generating said surfaces ; a simplified hob is then made from said theoretical hob, and used for milling pinion-tools adapted to produce rough-cut gears after sharpening the leading faces of said pinion-tools ; the outlines of these gears are then compared with the desired outline for any possible correction of the simplified hob outline and the resultant correction of the pinion-tools and workpieces ; this method is applicable to the cutting of spur or helical teeth, whether of the involute type or not, for both internally toothed and externally toothed gears, by using milled pinion-tools.

3,720,990
LIQUID PHASE SINTERED MOLYBDENUM BASE ALLOYS
Earl I. Larsen, Indianapolis, Ind., assignor to P. R. Mallory & Co. Inc., Indianapolis, Ind.
No Drawing. Filed Jan. 13, 1969, Ser. No. 790,861
Int. Cl. B22f *3/00*
U.S. Cl. 29—182 **18 Claims**

A molybdenum base alloy containing at least two metallic elements which form an alloy which melts at a temperature considerably below that of molybdenum and when in the molten state dissolves appreciable molybdenum during liquid phase sintering and which may be shaped before or after sintering for example, by machining, to form desired shapes such as hot metal forming tools such as die casting dies, cores, etc., thus avoiding expensive hot working and/or hot forging is described.

3,720,991
MACHINE FOR SEALING BALLOONS AND THE LIKE
Rudolph L. Allison and Gary L. Lindstrand, Rockford, Ill., assignors to MTL Incorporated, Rockford, Ill.
Filed Apr. 12, 1971, Ser. No. 133,143
Int. Cl. B23g *7/10*
U.S. Cl. 29—211 D **11 Claims**

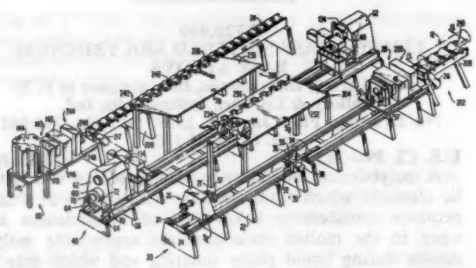


The machine includes a reciprocating needle which doubles over the neck of the balloon and draws the neck through a hole in a disc. The latter seals the balloon gastight by pinching together the doubled-over section of the neck.

3,720,992
AUTOMATIC PIPE HANDLING SYSTEM
John W. Hyatt, 23 Edmund Street, Malden, Mass.
Filed March 1, 1971, Ser. No. 119,644
Int. Cl. B23p *19/00*, *19/04*
U.S. Cl. 29—59 **59 Claims**

An automatic machine and control system for automatically cutting elongated pieces of material such as tubes, pipe bar stock and the like, into pieces of pre-determined lengths at a first station. Each cut piece is automatically conveyed to a

second station where it is clamped and centered with respect to threading and reaming heads which automatically thread and ream both ends of the clamped piece simultaneously. The threaded piece is then released from the clamping means and automatically conveyed to a third station where one of the threaded ends is automatically coated with thread sealing material, following which a fitting is automatically attached to the coated threads. The completed assembly is then automatically conveyed to a storage area. The automatic threading station employs automatically adjustable die heads which automatically compensate for pieces having different diameters



with the reaming portion of the die head being automatically adjusted concurrently with the threading portion. The distance between the two die heads of the automatic threading station is automatically adjusted to compensate for varying lengths of pieces to be threaded. The automatic control system and stations can be adapted for operation without any one of the stations, that is, the cutting station can be used in conjunction with the threading station or, the threading station can be used in conjunction with the fitting make-on station without requiring the third station to be incorporated into the system.

3,720,993

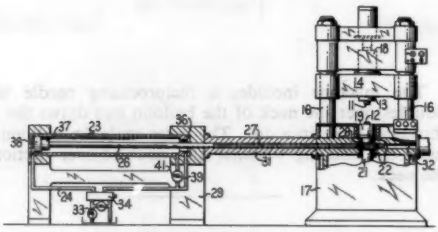
FRICTION WELDING METHOD

Charles G. Farmer, Edelstein, and Calvin D. Loyd, Peoria, both of Ill., assignors to Caterpiller Tractor Co., Peoria, Ill.

Division of Ser. No. 728,646, May 13, 1968, Pat. No. 3,567,100. This application Oct. 26, 1970, Ser. No. 84,139

Int. Cl. B23k *27/00*

U.S. Cl. 29—470.3 **5 Claims**



Friction-welding apparatus comprising a rack and pinion for translating force from a unidirectionally, linearly acting hydraulic motor into rotational force and applying the resultant rotational force to one of a pair of relatively rotatable weld pieces. Programming means regulate operation of the hydraulic motor to precisely determine energy input to a weld interface between the weld pieces.

3,720,994

METHOD OF FORMING METAL TUBING

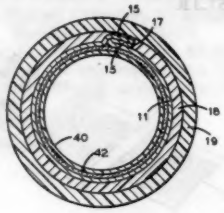
Rolf K. Wagele, Isernhagen, Germany, assignor to Kabel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft, Hannover, Germany

Filed Nov. 23, 1971, Ser. No. 201,298

Claims priority, application Germany, Nov. 27, 1970, P 20 58 379.3

Int. Cl. B23k *31/02*

U.S. Cl. 29—477.7 **8 Claims**



A method of forming metal tubing from very thin metal tape, wherein the tape is folded about a non-metallic tubing to convert the same into tubular form; the marginal edge portions of the tape providing tab portions extending radially and in contacting relation, the tab portions being metallically integrated at their outer edges and then folded about the base thereof into contact with the outer surface of the metal tubing; the non-metallic tubing being selectively (1) removed from the formed metal tubing; or (2) retained to form a liner for the metal tubing.

3,720,995

MODULE FRAMES AND METHOD OF MAKING SAME

Victor E. Brown; Raul L. Mora, both of Fort Lauderdale, and Morton T. Evans, Pompano Beach, all of Fla., assignors to Behring Corporation, Fort Lauderdale, Fla.

Division of Ser. No. 53,502, July 9, 1970. This application Aug. 26, 1971, Ser. No. 175,282

Int. Cl. B23k *1/20*

U.S. Cl. 29—482 **10 Claims**

The method of making frames and frame units for modules of modular building includes steps of punching perimeter beams to form stops on the beams where cross-beams are to be located, and assembling the cross-beams with a pair of the perimeter beams by butting the ends of the cross-beams against corresponding stops to position the cross-beams without using jigs or fixtures to establish their positions. Retainers may be formed in the perimeter beams next to the stops to temporarily retain the cross-beams in place until they are welded to the perimeter beams. In some frame units, the perimeters beams and cross-beams are metal channels, and the beams are assembled flange-to-flange and web-to-web. One weld is made to connect each abutting pair of flanges next to the webs, and another weld is made at a point separated farther from the webs so that the webs reinforce each other and the flanges reinforce each other. Cross-beams may also be

welded to the stops on the perimeter beams. The invention includes the frame units, part of the strength and load handling capabilities of which are derived from particular arrangements of stops and welds.

3,720,996

PROCESS FOR THE MANUFACTURE OF A RIGID CONNECTION BETWEEN A SYNTHETIC BODY AND A METAL BODY

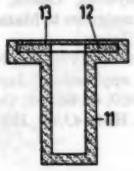
Manfred Tschermak, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munchen, Germany

Filed Oct. 15, 1969, Ser. No. 866,592

Claims priority, application Germany, Oct. 16, 1968, P 18 03 307.3

Int. Cl. B29c *6/02*

U.S. Cl. 29—527.1 **5 Claims**



The method of producing a firm connection between a synthetic body and a metal body. The region of the synthetic body intended for the connection has a, at least partially, porous sintered metal body of predetermined shape inserted into it in such a way that the synthetic material of the synthetic body penetrates the pores of the sintered metal body. An additional metal body (bodies) is fastened to the exposed portion of the sintered metal body.

3,720,997

EUTECTIC PLATING AND BREAKING SILICON WAFERS

James R. Black and Elliott Philofsky, Phoenix, Ariz., assignors to Motorola, Inc., Franklin Park, Ill.

Filed Jan. 11, 1971, Ser. No. 105,404

Int. Cl. B01j *17/00*

U.S. Cl. 29—583 **5 Claims**

A wafer of semiconductive material in the normal manufacture of making transistors or integrated circuits has many individual transistors or IC's produced on one side thereof and the other side thereof is coated with gold. Then the wafer is scribed, usually on the one side thereof, with scribe lines to assist in breaking the wafer into individual transistor or IC chips. As here disclosed a quenched silicon-gold alloy is produced on the other side of the wafer and the wafer is scribed. Since the quenched silicon-gold alloy is very brittle, the wafer breaks more easily on the scribe lines than do prior art scribed wafers.

3,720,998

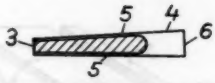
METHOD OF MANUFACTURING COMMUTATOR SEGMENTS OF COMPOUND MATERIAL

Assar Malm, and Jan-Erik Fransson, both of Vasteras, Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed May 6, 1971, Ser. No. 140,687

Int. Cl. H01r *43/00*

U.S. Cl. 29—597 **4 Claims**



Commutator segments are formed by hydrostatically extruding a billet having a core of aluminum or aluminum alloy and a tubular copper or copper alloy casing through a die of such shape that a thin strip is produced. This strip, either during extending or by rolling after extrusion, is given a shape which is thinner in the center than at the edges. The strip is cut longitudinally along its central axis and cut to suitable lengths.

3,720,999

METHOD OF ASSEMBLING TRANSISTORS

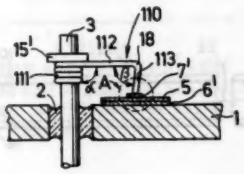
Johannes Nier, Stuttgart, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Continuation-in-part of Ser. No. 869,583, Oct. 27, 1969, abandoned, which is a division of Ser. No. 757,407, Sept. 4, 1968, Pat. No. 3,584,265. This application April 29, 1971, Ser. No. 138,666

Claims priority, application Germany, May 9, 1970, P 20 22 717.2

Int. Cl. B01j *17/00*; **H01l** *5/04, 7/60, 9/08, 11/02, 11/04, 15/08*

U.S. Cl. 29—587 **9 Claims**



A transistor, wherein a semiconductor wafer is soldered to a metallic base and has one or two exposed contacts which are connected to pin-shaped terminals of the base by U-shaped elastic leads having coiled first end portions, straight intermediate portions and straight second end portions, is assembled by deforming the leads to tilt the coiled end portions with reference to the terminals and to thereby clamp such coiled end portions to the terminals in positions in which the end faces of the second end portions are in full surface-to-surface abutment with layers of solder which coat the contacts on the wafer, or by causing the second end portions to bear against the respective contacts merely by the action of gravity. The thus assembled working parts of the transistor are thereupon heated in a soldering furnace to bond the wafer to the base and to simultaneously solder the second end portions of the leads to the respective contacts. The coiled end portions are bonded to the respective terminals in response to melting of rings of soft solder which are slipped onto the terminals prior to heating so as to rest on the respective coiled end portions.

3,721,000

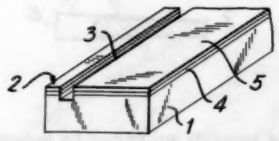
METHOD OF MAKING A MAGNETIC HEAD

Noriaki Okamoto, Kanagawa, Teruo Wakabe, Tokyo, and Kazuo Nozawa, Chiba-ken, Japan, assignors to Sony Corporation, Tokyo, Japan

Original application Mar. 12, 1969, Ser. No. 806,477, now Patent No. 3,578,920. Divided and this application Oct. 23, 1970, Ser. No. 83,587

Int. Cl. H01f *7/06*

U.S. Cl. 29—603 **2 Claims**



A magnetic head has a gap spacer between magnetic core members thereof, which spacer is constituted by at least one layer of a non-magnetic metal oxide formed over a protective layer, such as, silica dioxide, on a gap-defining surface of the magnetic core members. The metal oxide layer is formed over the protective layer by heating on the latter an acid solution of a non-magnetic metal halide or a solution of an organic metal salt, during which heating the protective layer prevents oxidation and etching of the underlying gap-defining surface.

3,721,001

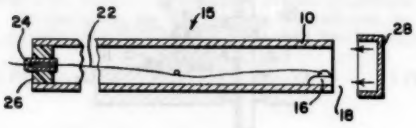
METHOD OF MAKING QUICK RESPONDING THERMOMETER

Philip C. Crosby, Wakefield; Robert J. Goyette, Chelmsford, and Douglas M. Bauer, Danvers, all of Mass., assignors to Council Commerce Corporation, Jericho, L.I., N.Y.

Filed Jan. 21, 1971, Ser. No. 108,615

Int. Cl. H01c *7/04*

U.S. Cl. 29—612 **8 Claims**



A process for making a quick-responding, thermally-sensitive, probe for use in a thermometer comprising placing an abradable thermally-sensitive element such as a thermistor in a probe and calibrating the element in place while using the wall of the probe to help support it and moderate the rate of abrasion. The novel device formed by this technique advantageously comprises a very thin wall constructed of a material of high thermal diffusivity which wall also acts as an electrical lead to an electronic temperature-measuring circuit.

3,721,002

HIGH VOLTAGE CABLE SPLICING AND TERMINATING METHODS

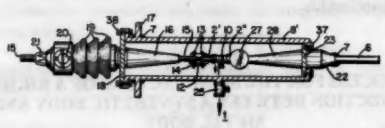
Paul F. Pugh, 4082 Sequoyah Road, Oakland, Calif.

Filed May 15, 1970, Ser. No. 37,570

Int. Cl. H01r *43/00*

U.S. Cl. 29—628 **10 Claims**

The circulation of a fluid through the center of a high voltage cable can be used to monitor the cable temperature and to increase the loading limit of the cable. The methods for terminating and splicing fluid-filled power cables with fluid circulation and for controlling the fluid pressure when the cables are terminated in free air are novel and a part of a high voltage cable system.



3,721,003

METHOD FOR ATTACHING WIRES TO A FLAT ARTICLE

Kazunori Ueda, Neyagawa; Eiichi Masuo, Moriguchi; Hiroaki Yagi, Higashi-Sumiyo-shi, Osaka, and Sinya Nishimoto, Suita, all of Japan, assignors to Matsashita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 23, 1970, Ser. No. 83,319

Claims priority, application Japan, Oct. 27, 1969, 44/86237; Oct. 27, 1969, 44/86238; Oct. 27, 1969, 44/86239

Int. Cl. H01r *43/00;* **H05k** *43/00*

U.S. Cl. 29—628 **3 Claims**

A method of attaching lead wires to both surfaces of a disk-shaped electric article such as a ceramic capacitor prior to soldering the wires to the article, wherein the disk-shaped article is first inserted between unevenly crossed end portions of a resilient conductive wire member bent in the shape of a hairpin and then turned a half round about the longitudinal axis of the wire member while the bent portion of the wire member is unmovably held, so that the article is firmly gripped between wires; and a machine which automatically performs the above-described process.

3,721,004

PRUNING TOOL

John Q. Buckles, Cincinnati, Ohio

Continuation-in-part of Ser. No. 125,276, March 17, 1971, abandoned. This application April 7, 1972, Ser. No. 241,900

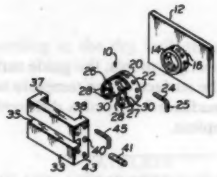
Int. Cl. B26b *15/00*

U.S. Cl. 30—228 **16 Claims**

A pruning tool comprising an elongated hollow tube, which may be in sections, a cutter on one end of the tube having a

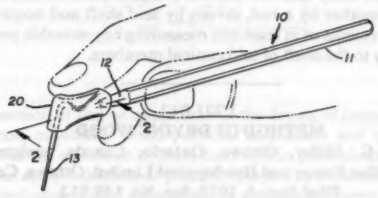
pivoted cutting element, a piston and cylinder at the other end of the tube and a flexible cable passing through the center of the tube and connected to the piston and cylinder at one end of the cutting element at the other end wherein the cutting element is operated by applying tension to the cable by means of the piston and cylinder. Centering means are provided for the cable so that the cable, when tensioned, stresses the tube only in compression, without introducing any substantial bending moment.

3,721,005
ORTHODONTIC BRACKET
Howard Cohen, 2791 West Fifth Street, Brooklyn, N.Y.
Filed Aug. 31, 1971, Ser. No. 176,500
Int. Cl. A61c *5/08*
U.S. Cl. 32—14 A **10 Claims**



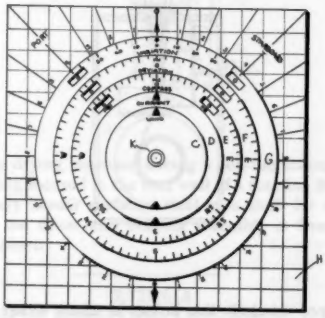
A selectively adjustable orthodontic bracket for use in both torqueing and uprighting of malpositioned teeth. The bracket permits coupling a conventional orthodontic arch wire to the tooth band positioned about a malpositioned tooth so as to permit selective rotation of the arch wire either about its axis or transversely thereto with respect to the tooth to thereby insure the transmission of desired forces between the arch wire and the tooth. The bracket is formed with a slotted arch wire engaging plate, the arch wire being engaged within the slot of said arch wire engaging plate. A universal joint is formed on the side of the arch wire engaging plate remote from the slot for securement to the tooth engaging band, the universal joint being selectively fixable in any position to which set so that the arch wire engaging plate may be rotated about an axis parallel or transverse to that of the arch wire, to permit selective provision of either torqueing or uprighting forces to the tooth.

3,721,006
FINGER PAD FOR DENTAL INSTRUMENTS
Oscar Malmin, 127 East Wayne Avenue, Akron, Ohio
Filed May 28, 1971, Ser. No. 147,858
Int. Cl. A61c *3/00*
U.S. Cl. 32—40 R **4 Claims**



A finger pad for utilization in connection with angled dental instruments such as pluggers, margin trimmers, enamel hatchets, etc. The finger pad includes a piece of plastic or similar material mounted on the angled portion of the instrument and provided with pressure points contoured into the pad for reception of the tip of the operator's finger. The contoured portions are positioned so that a direct pressure is properly directed toward the tip of the tool thereby eliminating inaccuracies. The pad can either be removably placed on the angled portion of the tool, permanently secured to the end of the tool handle or made integral therewith.

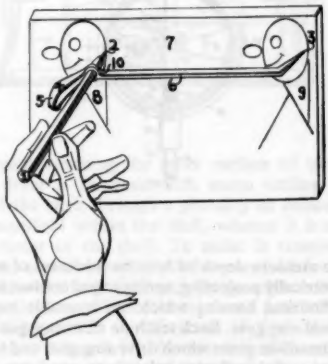
3,721,007
NAVIGATION CALCULATOR
Philip M. Banner, 28 Oxford Road, Massapequa, N.Y.
Filed April 13, 1970, Ser. No. 27,535
Int. Cl. G01c *21/20*; G06c *27/00*
U.S. Cl. 33—1 SD **3 Claims**



A navigation calculator comprising a base plate having angular markings, a plurality of round members rotatably mounted on said plate and on each other, each of the round members being adapted to be moved to insert the navigation parameters such as magnetic variation, compass deviation, compass reading, current direction and wind direction so that the various parameters are added to give a final reading.

A pair of protractor arms are adapted to be rotatably mounted on top of the stack of round members for drawing a course on a chart.

3,721,008
MARKER AND TRACKING ARM
Eugene P. Frank, 350 East St. James St., San Jose, Calif.
Filed Oct. 26, 1971, Ser. No. 192,467
Int. Cl. B43l *13/16*
U.S. Cl. 33—41 E **1 Claim**



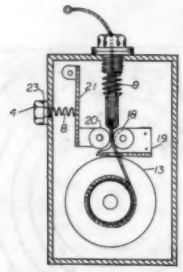
The marker and tracking arm is in general a pen or pencil with an arm extending from it with a tracking point that, due

to the influence of gravity, follows an identical track as the marker point.

3,721,009
CHALK LINE HOLDER

Steve M. Lucich, P.O. Box 305, Reno, Nev.

Continuation of Ser. No. 854,334, June 25, 1969. This application April 5, 1971, Ser. No. 131,529
Int. Cl. B44d *3/38*
U.S. Cl. 33—87 2 Claims

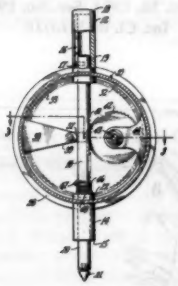


An improved chalk line holder in which either a liquid or dry marking agent can be utilized for striking lines of a varying degree of permanence. The packing gland through which the cord passes is held under compression thereby preventing enlargement of the orifice in the packing gland and the subsequent loss of marking agent through the enlarged orifice.

3,721,010
DIAL INDICATOR GAGE

Harold E. Ristow, 1332 W. 186 Street, Gardena, Calif.

Continuation-in-part of Ser. No. 817,438, April 18, 1969, abandoned. This application Feb. 8, 1971, Ser. No. 113,125
Int. Cl. G01b *5/00*
U.S. Cl. 33—172 R 8 Claims

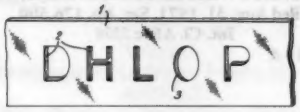


Gage to measure depth of bore or thickness of workpiece, etc. Diametrically projecting, spring-urged contact stem transverses cylindrical housing which has rotatable inner sleeve with internal ring gear. Rack teeth on stem engaged by one or more intermediate gears which drive ring gear and turn sleeve which carries dial indicator relative to overlying stationary pointer, the zero setting of which can be changed however to indicate desired standard for workpiece. Gear train and diametrically large dial face produce very high accuracy.

3,721,011
DRAWING TEMPLATE

Gerold Anderka, Hamburg, Germany, assignor to Rapidograph, Inc., Bloomsburg, N.J.

Filed April 16, 1970, Ser. No. 29,203
Claims priority, application Germany, April 24, 1969, P 19 20 861.8
Int. Cl. B41n *1/24*
U.S. Cl. 33—174 B 3 Claims

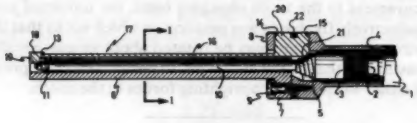


A template for drawing symbols, the guide surfaces defining the symbols and/or the surface of the template adjacent to the edges of the guide surfaces being of a different color to the remainder of the template.

3,721,012
INTERNAL MICROMETER

Albert Muller, Crissier, Switzerland, assignor to Tesa S.A., Renes, Switzerland

Filed May 14, 1970, Ser. No. 37,193
Claims priority, application Switzerland, May 16, 1969, 7461/69
Int. Cl. G01b *3/46, 5/08*
U.S. Cl. 33—178 R 4 Claims



The present invention has for its object, an internal micrometer comprising a cylindrical body, a control shaft which is movable in a rotational and longitudinal manner within the body and two conical coaxial members connected to one another by a rod, driven by said shaft and controlling the movements of at least one measuring key movable perpendicularly to the shaft of said conical members.

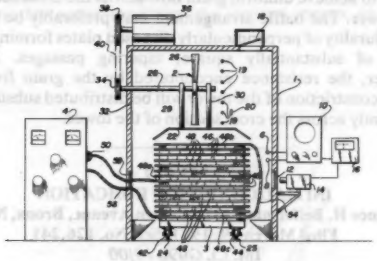
3,721,013
METHOD OF DRYING WOOD

Donald G. Miller, Ottawa, Ontario, Canada, assignor to Canadian Patens and Development Limited, Ottawa, Canada

Filed June 4, 1971, Ser. No. 149,912
Int. Cl. B01k *5/00*
U.S. Cl. 34—1 4 Claims

A method of rapidly drying wood by combining radio frequency or microwave heating with circulated heated air kiln drying, in which the surface temperature of the wood is measured, the wet and dry bulb temperatures of the circulated heated air within the kiln are measured, the wet bulb temperature is maintained according to a kiln schedule for the species and thickness of the wood, and in addition the input of radio

frequency or microwave energy and the dry bulb temperature of the kiln are regulated to control the surface temperature of



the wood according to the dry bulb temperature of the kiln schedule.

3,721,014

METHOD OF AND APPARATUS FOR THE DRYING OF COMMINUTED MATERIAL

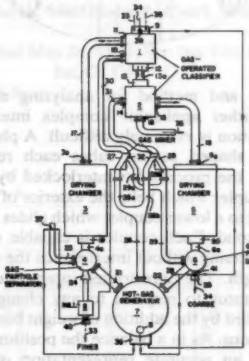
Peter Voelskow, Bad Kreuznach, Germany, assignor to G. Siempelkemp & Co., Krefeld, Germany

Filed May 14, 1971, Ser. No. 143,498

Claims priority, application Germany, May 19, 1970, P 20 24 197.8

Int. Cl. F26b *3/10*

U.S. Cl. 34—10 **12 Claims**



A method of and an apparatus for the drying of comminuted material, especially wood particles and fibers and particles and fibers of cellulosic or plant materials in general, as may be used for the production of pressed board. The particulate mixture, including a fine component, a coarse component and at least one further component such as splinters, is subjected to gas classification to separate the fines from the coarse particles which are conveyed in respective hot-gas streams eventually to respective separators. In the separators, the particles are recovered from the cooled gas, part of which is returned to the hot-gas generator which the remainder or at least another part is mixed with the hot gases produced by this generator for recycling to the drying stage. The gas cycles of the fine and coarse stages may be operated independently.

3,721,015

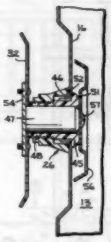
BEARING ASSEMBLY

Robert R. Sisler, Louisville, Ky., and Claude L. Blake, New Albany, Ind., assignors to General Electric Company, Louisville, Ky.

Filed Sept. 23, 1971, Ser. No. 183,032

Int. Cl. F26b *11/02*

U.S. Cl. 34—133 **3 Claims**



A clothes drying machine having a self-lubricating plastic sleeve bearing secured to the rear wall of a rotating drum, and the stationary harder surfaced steel stub shaft for rotatably supporting the drum and bearing assembly is fixed to the machine cabinet.

3,721,016

METHOD OF REMOVING CONDENSATE FROM A ROTARY DRYER

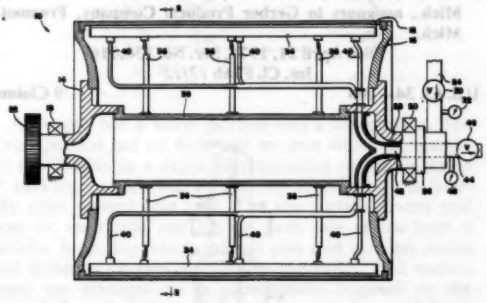
Charles A. Lee and Frank D. Sorrells, Knoxville, Tenn., assignors to International Paper Company, New York, N.Y.

Original application Aug. 4, 1969, Ser. No. 847,111, now Patent No. 3,640,000, dated Feb. 8, 1972. Divided and this application June 30, 1971, Ser. No. 158,478

The portion of the term of the patent subsequent to Feb. 8, 1989, has been disclaimed

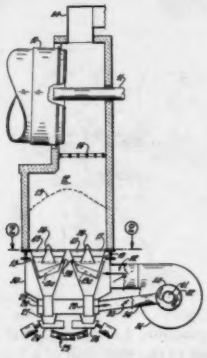
Int. Cl. F28g *13/04*

U.S. Cl. 34—125 **4 Claims**



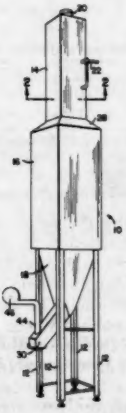
Condensate rimming the inner surface of the shell of a rotary dryer is removed with steam exiting from the interior of the shell through a plurality of orifices into an exhaust manifold within the shell, whence it is exhausted to the exterior of the shell. To assist in removal of the condensate, a plate attached to the manifold forms a plurality of flow channels substantially parallel to the surface of the condensate. The cross-sectional area of the flow channels decreases in the direction of flow of the steam so that steam driven from the interior of the shell is accelerated along the surface of the condensate over a substantial distance to shear water from the inner surface of the shell and entrain the water in the steam as the steam passes through the orifices into the manifold.

3,721,017
APPARATUS FOR COOLING PARTICLES
Lee H. Niems, 2702 Brassie, Flossmoor, Ill.
Filed May 10, 1971, Ser. No. 141,747
Int. Cl. F27b *7/02*
U.S. Cl. 34—167 **15 Claims**



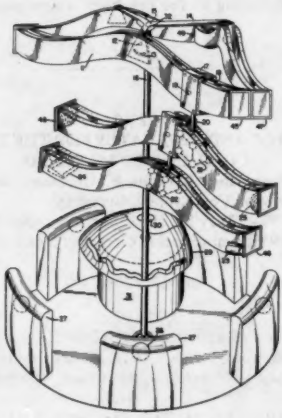
Apparatus for cooling heated pieces of matter, particularly calcined lime pebbles or particles in which the hot material to be cooled is passed through a hopper and cooled by air introduced under pressure at the perimeter of the mass through bias aligned louvers in the side walls of the hopper. A particular aspect of the invention is the alignment of the louvers at an angle to horizontal to establish different length air paths through the mass to compensate for the different resistances to flow presented by the surface angle of repose of the material and the natural tendency of the particles to become segregated in various predeterminable regions of the mass with consequent localized concentration of heat in the mass.

3,721,018
GRAIN STEAMING APPARATUS
Maurice W. Brandt, and Franklin J. Shears, both of Fremont, Mich., assignors to Gerber Products Company, Fremont, Mich.
Filed April 21, 1971, Ser. No. 136,016
Int. Cl. F26b *17/12*
U.S. Cl. 34—168 **9 Claims**



Grain steaming apparatus comprising a tower having three sections, an upper section, a central section, and a lower section. The grain to be steamed is introduced into the top of the upper section, and steam is communicated into the interior thereof via a pair of steam manifolds. The lower section of the tower comprises a baffle arrangement adapted to control the flow of wheat in the tower while preventing channeling of the grain, to achieve uniform grain flow across the cross section of the tower. The baffle arrangement may preferably be formed by a plurality of perpendicularly disposed plates forming a grid work of substantially square, tapering passages. In this manner, the resistance encountered by the grain from the lower constriction of the tower will be distributed substantially uniformly across the cross section of the tower.

3,721,019
INITIAL CONDITION INDICATION
Lawrence H. Befferman, 3316 Colden Avenue, Bronx, N.Y.
Filed March 19, 1971, Ser. No. 126,241
Int. Cl. G09b *19/00*
U.S. Cl. 35—1 **9 Claims**

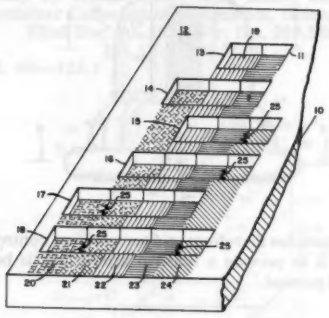


An apparatus and method for analyzing manufacturing processes and other applicable complex interrelationships where interpretation is extremely difficult. A plurality of hollow bell curve shaped square tubes each representing a characteristic of the process are interlocked by pairs with a rolling upper coupler which belts the exterior of the first tube and is connected to a lower coupler which glides within the interior of the second. Each coupler is capable of supporting and freely transversing without interference the extremes of a tubes entire length. The unrestricted interrelated movement allows the apparatus to respond to any change of characteristic as simulated by the addition of weight based on mathematical calculations. As in a balance the position of the interlocked tubes is an accurate representation of the altered process. A method and apparatus is given for determining the degree of response of tubes, interpreting results, and creating movement with a random generator for observing the effect of many characteristic attributes on the process.

3,721,020
EDUCATIONAL DEVICE
Hulbert Martin, 2928 Hillegass Ave., Berkeley, Calif. 94705
Filed May 26, 1971, Ser. No. 146,907
Int. Cl. G09b *1/16*
U.S. Cl. 35—35 H **9 Claims**

An educational device is disclosed comprising a first, second and third means having different distinguishing indicia thereon. The first means includes at least one consonant thereon that normally occurs immediately before a vowel appearing in a single syllable word. The

second means includes at least one vowel thereon. The third means includes at least one consonant thereon that normally occurs immediately after a vowel appearing in a single syllable word. A board or the like is provided having a plurality of linearly disposed rows with delineated areas for accommodating the various means, at least

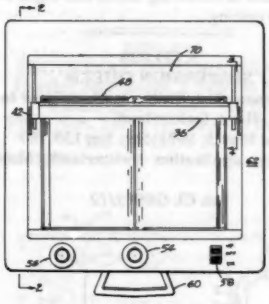


some of the areas being aligned in linearly disposed columns normal to the linearly disposed rows with all of the areas in each normally aligned column being of the same indicium, this latter indicium corresponding to the indicia on each of the means. In this manner, the proper placement of the means on the board will result in the formation of a single syllable word or a part thereof.

3,721,021
READING PACER DEVICE

Merrick W. Stewart, 5 Oriole Drive, Essex County, Mass., and Gerard J. Marks, 9403 Stateside Court, Montgomery County, Md.

Filed May 24, 1971, Ser. No. 146,113
Int. Cl. G09b *17/04*
U.S. Cl. 35—35 B **10 Claims**

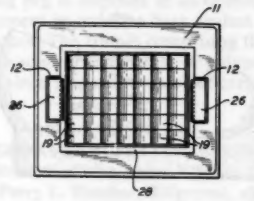


The disclosure embraces a reading pacer device having a supporting surface for reading material and a pacer bar mounted for traversing the reading material; a variable speed electric motor is provided for moving the pacer bar and an electronic circuit is provided including limit switches for controlling the operation of the motor to vary the speed of the motor to correspond to a pre-selected number of words per unit of area of reading material traversed by the pacer bar.

3,721,022
DESIGN DEVICE

John Mercorelli, 1265 Van Houten Avenue, Clifton, N.J.

Filed Jan. 15, 1971, Ser. No. 106,864
Int. Cl. G09b *1/20*
U.S. Cl. 35—77 **4 Claims**

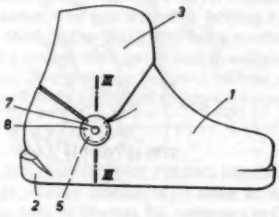


The invention is a design device in which the beads have keyways, and the axles on which they are mounted have keys engageable and disengageable from the keyways.

3,721,023
SPORTS BOOT

Max Kastinger, Seewalchen, Attersee, Austria

Filed Sept. 28, 1971, Ser. No. 184,488
Claims priority, application Austria, Oct. 8, 1970, 9,062
Int. Cl. A43b
U.S. Cl. 36—2.5 AL **4 Claims**



An upper has a lower portion and a top portion. The lower portion has on each side an area which is recessed on the outside in a depth corresponding to the thickness of said top portion and an external recess which is laterally open toward said area. The top portion covers said area on each side and has on each side of the boot a circular hinge lug which extends into said external recess and defines a circumferential gap therewith. Two coaxial rivets are arranged to be substantially disposed on the axis of the ankle joint of a foot contained in said boot. Each of said rivets pivotally connects one of said lugs to said lower portion. Two cover plates are provided, each of which is secured to one of said rivets and flush with the surface of said boot and covers the adjacent one of said circumferential gaps.

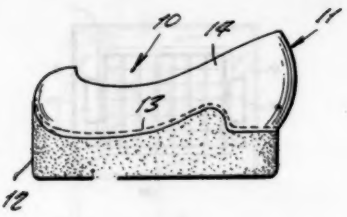
3,721,024
CEMENT COBBLER

Peter Innerbickler, 1141 Pine Avenue, Apartment No. 2, Long Beach, Calif.

Filed Aug. 2, 1971, Ser. No. 168,080
Int. Cl. A43b *1/10*
U.S. Cl. 36—4 **2 Claims**

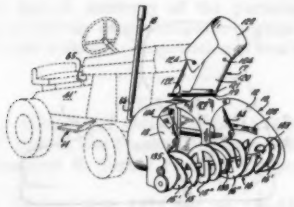
Footwear for providing foot comfort to persons who are obliged to stand or walk for long periods on hard cement

walks or floors, the device consisting of shoes that are molded as a standard rain slippers of rubber or other materials and which includes an upper and a sole the bottom edge of the sole having a flange or lip for hiding an enjoinment with a relatively



thick sponge rubber sole placed beneath the shoe and secured there to by means of adhesive backed tape that is readily and easily removed for purpose of conveniently replacing a worn sponge rubber sole.

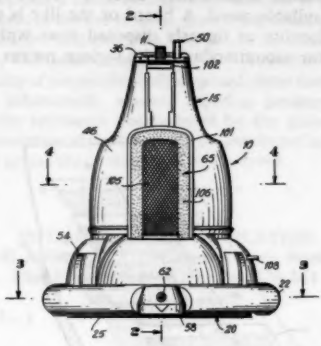
3,721,025
POWER DRIVEN SNOW BLOWER
Matthew F. Orr, Shawnee Mission, Kans., assignor to Poloron Products of Indiana, Inc., New Rochelle, N.Y.
Filed Mar. 13, 1969, Ser. No. 806,878
Int. Cl. E01h 5/00
U.S. Cl. 37—43 E **1 Claim**



A snow blower for attachment to a tractor having counter rotating blowers and two sets of augers supported by a unitary housing. The snow blower is provided with rearwardly extending arms secured to a support assembly removably attached to the tractor. The support assembly includes means for transmitting power from the tractor engine to the snow blower as well as means for raising and lowering the blower relative to the tractor, locking the blower in the raised position and adjusting the height of the blower from the surface being cleared.

3,721,026
APPARATUS FOR DRY CLEANING AND PRESSING
David J. McCallum, Nyack, N.Y., assignor to National Appliance Industries, Inc., New York, N.Y.
Filed Aug. 2, 1971, Ser. No. 167,898
Int. Cl. D06f 75/00
U.S. Cl. 38—75 **29 Claims**

The invention provides an effective and practical method and apparatus of applying a series of commercially obtainable aerosol compounds for fabric improvement, as well as an efficient means for withdrawing deposited foreign matter in combination with normal pressing means by use of a portable dry-cleaning unit adaptable for home use which includes means to apply the dry-cleaning agent onto the surface to be cleaned, means for thereafter vacuum cleaning and agitating the fabric

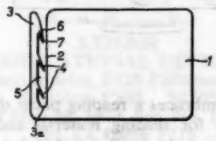


to remove particles therefrom and temperature control means for ironing it to provide a finished article that is both dry-cleaned and pressed.

3,721,027
NEW STYLE PICTURE FRAME PANEL
Robert J. Slavsky, Lathrup Village, Mich., assignor to Shen & Slavsky, Inc., Detroit, Mich.
Filed June 22, 1971, Ser. No. 155,436
Int. Cl. G09f 3/18
U.S. Cl. 40—10 R **1 Claim**

A pricing panel of sheet plastic with bevelled edges simulating a picture frame, and with retroverted extensions at its upper and lower edges for snapping the panel into upper and lower grooves of a C-shaped molding, particularly designed for supermarket use in mounting words and digits for goods indentification and pricing.

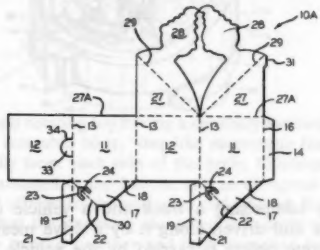
3,721,028
SUSPENSION SHIELD
Harry Lehner, Graenichen, Switzerland, assignor to Stoba AG, Plombenfabrik, Horn, Switzerland
Filed May 3, 1971, Ser. No. 139,787
Claims priority, application Switzerland, May 6, 1970, 6802/70
Int. Cl. G09f 3/12
U.S. Cl. 40—22 **13 Claims**



A suspension shield, such as a marking or a price shield or the like, embodying a substantially flat label support or carrier and attachment means for securing this shield to a package, such as a packaging net or the like of a packaged article. The

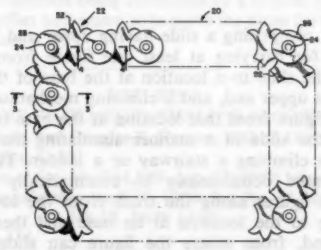
invention contemplates that the attachment means comprises at least one tongue member provided at at least one edge of the label support, this tongue member being equipped with at least one barb. The end of such at least one barb forms together with an edge of the label support or with a second tongue a narrow passageway.

3,721,029
DISPLAY DEVICE
Timothy K. Austin, Santa Ana, Calif., assignor to Container Corporation of America, Chicago, Ill.
Filed Dec. 20, 1971, Ser. No. 209,586
Int. Cl. G09f *1/00*
U.S. Cl. 40—124.1 **4 Claims**



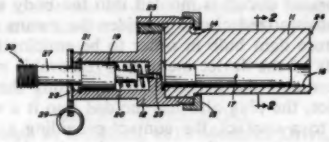
A display device is erectable from a flattened to an erected position, and is formed from a blank of paperboard or the like comprised of major and minor pairs of foldably interconnected panels in the shape of a flattened tube. Structure is provided for erecting the flattened tube and consists of a pair of opposed erecting flaps connected to corresponding ends of a pair of major and minor panels. Each of the erecting flaps has a diagonal fold line therein enabling the erecting flaps to be folded upon themselves between adjacent major and minor panels when in the form of a flattened tube. Resilient means connected across the erecting flaps bias the major and minor panels to an erected position, and indicia supporting means foldably extending from an adjacent pair of major and minor panels are folded between the major and minor panels, and an indicia bearing extension foldably connected to at least one of the indicia supporting means is movable to an erected position upon the movement of the major and minor panels to the erected position upon operation of the resilient biasing means.

3,721,030
SECTIONAL PICTURE FRAME
Hartley Steinhardt, 1 Merritt Road, Farmingdale, N.Y. 11735
Filed Nov. 26, 1971, Ser. No. 202,509
Int. Cl. G09f *1/12*
U.S. Cl. 40—155 **9 Claims**



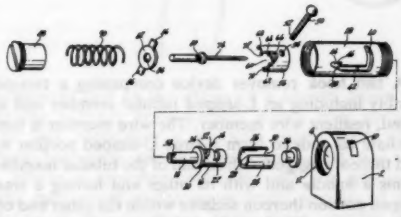
The picture frame comprising the present invention is made up of a plurality of identical elements, each of which includes an integral pin and an integral socket spaced laterally from the pin. In the assembled condition, the pin of one of the elements is received in the socket of the next adjacent element. A cap is secured to each pin to capture the next adjacent element. The picture and/or the glass covering the picture is positioned behind a lip that is integral with and extends inwardly from each element. A locking peg is disposed in an opening in selected ones of the element in order to bear against the rear surface of the picture. The frame, comprising the present invention, may be square, rectangular or polygonal and may be of any size since it is made up of discrete elements.

3,721,031
UNDERWATER REPEATING SHOTGUN
Charles W. Falterman, China Lake; William J. Griffith, Inyokern, and Perry L. Fletcher, Ridgecrest, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy
Filed Aug. 24, 1970, Ser. No. 66,510
Int. Cl. F41c *27/00, 1/00*
U.S. Cl. 42—1 L **7 Claims**



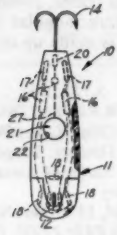
An underwater shotgun having a barrel rotatable relative to a firing mechanism. The gun is fired by jabbing it against a target such as a shark. After firing, the firing mechanism is positioned behind a second shell, in the barrel, and the gun is again ready for firing. The gun may be fired, without reloading, up to the number of shells contained within the barrel.

3,721,032
CASELESS CARTRIDGE FIRING MECHANISM
John Shum, Jr., Valley Station, Ky.; Dean R. Kilbourn, and Chao H. Lin, both of Marion, Ill., assignors to Olin Corporation, New Haven, Conn.
Filed May 6, 1971, Ser. No. 140,856
Int. Cl. F41j *1/00*
U.S. Cl. 42—1 R **11 Claims**



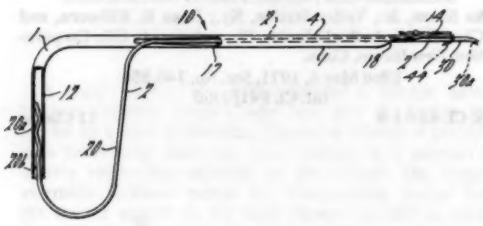
A caseless cartridge firing mechanism which uses a novel spring seal to seal the firing chamber. By virtue of a spring preload against the surface to be sealed, a pressure differential is built up between the sealing surfaces and creates the sealing force.

3,721,033
TRANSISTORIZED FLASHING FISH LURE
Milton Ray Haynes, 106 Baseline Road, Northville, Mich. 48161
Filed Mar. 31, 1970, Ser. No. 24,088
Int. Cl. A01k *85/00*
U.S. Cl. 43—17.6 1 Claim



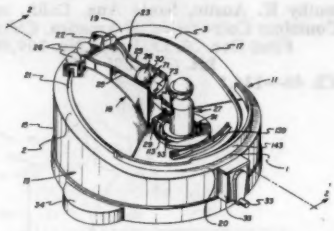
A fish lure having a molded plastic body in which a transistorized circuit is molded into the body of the lure. This transistorized circuit provides the means of flashing a miniature light bulb in order to be enticing to the fish. The body of the device includes a removable rubber plug which contains the batteries for operating the circuit of the device, the plug also has molded into it a wire which extends to a contact, the contact providing a method of engaging a wire on the opening the plug is received in. The other wire extends out of the opening of the plug for connection with the internal circuit of the lure.

3,721,034
FISH HOOK REMOVER
Paul R. Collins, 6065 Wing Lake Rd., Birmingham, Mich.
Filed Sept. 13, 1971, Ser. No. 179,656
Int. Cl. A01k *97/00*
U.S. Cl. 43—53.5 5 Claims



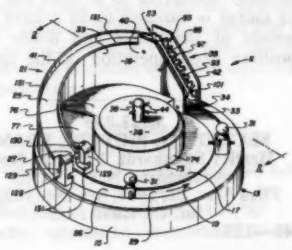
A fish hook remover device comprising a two-piece assembly including an L-shaped tubular member and an elongated, resilient wire member. The wire member is bent intermediate its ends to form a large U-shaped portion with one end thereof engaged with an end of the tubular member which forms a handle and with its other end having a smaller U-shaped portion thereon slidable within the other end of the tubular member. The large U-shaped portion acts as a spring for biasing the smaller U-shaped portion out of the end of the tubular member. To remove a hook from the mouth of a fish, the hook is positioned within the smaller U-shaped portion, the handle is squeezed, and the smaller U-shaped portion is brought into contact with the hook to provide camming and cutting actions to free the hook from the fish's mouth.

3,721,035
VEHICLE LOADING TOY
Adolph E. Goldfarb, 4614 Monarca Drive, Tarzana, Calif. 91356
Filed Feb. 24, 1971, Ser. No. 118,391
Int. Cl. A63h *33/30*
U.S. Cl. 46—40 16 Claims



A toy comprising a track and a vehicle disposed on the track and driven along it by a drive means. At least one discrete object is carried by the vehicle and caused to be released therefrom at an unloading point on the track. A movable figure is positioned to receive the object after it has been unloaded from the vehicle, the figure further being capable of moving with the object and loading it onto the same or another vehicle at a loading point on the track. The aforegoing is performed in a continuous cycling operation of unloading and loading.

3,721,036
SLIDE TOY
Adolph E. Goldfarb, 4614 Monarca Drive, Tarzana, Calif. 91356
Filed Feb. 25, 1971, Ser. No. 118,777
Int. Cl. A63h *33/00*
U.S. Cl. 46—43 5 Claims

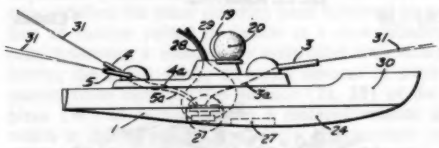


A toy comprising a slide having upper and lower ends, a track for carrying at least one figure from the lower end of the slide to a location at the base of the slide adjacent its upper end, and a climbing mechanism for moving the figure from that location at the base to the upper end of the slide in a manner simulating the motion of a person climbing a stairway or a ladder. The toy may be operated continuously to automatically move one or more figures along the track from the lower end of the slide to the location at its base and then up to its upper end, from where the figure can slide down the slide to the track. The cycle will automatically repeat so long as the toy is operated.

3,721,037
FLICKER TOY
William R. Allen, 1818 North New Hampshire, Apt. 112, Hollywood, Calif.
Filed Aug. 26, 1971, Ser. No. 175,045
Int. Cl. A63h *1/32*
U.S. Cl. 46—62 9 Claims

An animated rotating toy having a centrally located, axially symmetrical rotatable body, wing-like supporting frames extending axially from each side of the body, illustrated cards removably mounted in the frames, and an elongated loop of flexible cord affixed to the outboard end of each frame in a manner so that the opposing elongated side portions of the loops can be twisted together and then untwisted by pulling the loops taut, thereby imparting rotational momentum to the rotatable body. The illustrated cards have animated drawings on their opposing faces with the drawing on one face having slightly progressive changes from the drawing on the opposite face so as to create the illusion of movement of the characters depicted in the drawings as the toy is rotated.

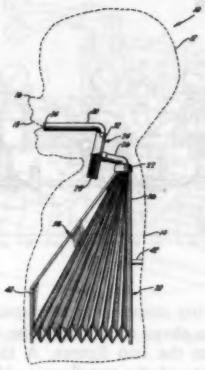
3,721,038
TOY BATTLESHIP
George S. Viczena, Dickson 2602, Canberra, Australia
Filed Aug. 25, 1971, Ser. No. 176,360
Int. Cl. A63h *23/02*
U.S. Cl. 46—93 3 Claims



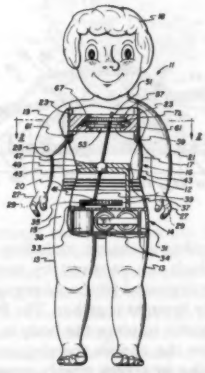
A toy boat for a child, the boat having toy guns that spray water, each of the toy guns being connected by a pipe to a diverted chamber within which there is a slideable diverter piston movable against compression coil springs adjacent each opposite ends thereof, the diverter chambers communicating through one way valves to stortch chambers into which water is admitted through a one way valve in the hull, and each of the storage chambers being connected by a flexible hose to a hand held rubber bulb pump so to move the water for spraying out of the guns.

3,721,039
TOY FIGURE WITH MECHANISM FOR BLOWING AIR
Donald L. Cook, and Douglas R. Hansen, both of 1111 2nd St., Santa Monica, Calif.
Continuation of Ser. No. 744,849, July 15, 1968, abandoned.
This application April 29, 1970, Ser. No. 31,824
Int. Cl. A63h *13/00*
U.S. Cl. 46—116 2 Claims

A toy doll capable of producing a stream of air from the doll's mouth. In mechanical embodiments the doll is squeezed, has its arm cranked, or a wind coil spring is used to operate a bellows, turn a fan and the like. In electrical embodiments a small power source and an electric motor are located in the doll and these are used to operate a fan, bellows, and the like to produce the airstream.

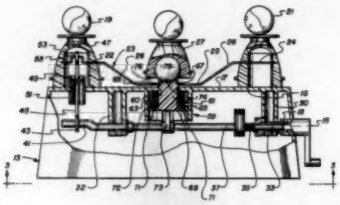


3,721,040
MECHANICAL DOLL
Adolph E. Goldfarb, 4614 Monarca Drive, Tarzana, Calif. 91356
Filed Feb. 24, 1971, Ser. No. 118,388
Int. Cl. A63h *11/00*
U.S. Cl. 46—119 9 Claims



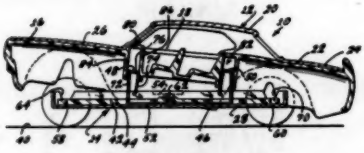
A mechanical doll in the shape of a human figure or robot having a lower body portion which may include a pair of legs supporting a movable upper body portion which has arms and a head disposed at the top thereof. Means is provided within the doll for selectively causing movement of the upper body portion of the doll relative to the stationary lower body portion, the doll being capable of a combination of movements in timed relation to achieve an orbital movement of a hand or hands of the doll. The doll may also be capable of providing a selected one of the motions, such as a side-to-side movement of the upper body relative to the lower body.

3,721,041
JUMP ROPE TOY
Adolph E. Goldfarb, 4614 Monarca Drive, Tarzana, Calif. 91356
Filed Feb. 24, 1971, Ser. No. 118,387
Int. Cl. A63h *11/00*
U.S. Cl. 46—119 10 Claims



An animated toy comprising two spaced-apart figures, and a wire in the shape of a jump rope disposed between and connected to the two figures. A third figure is disposed intermediate of the two figures. Means is provided for causing the wire to rotate between the two spaced-apart figures while the third intermediate figure moves up and down, allowing the jump rope to clear the base of the third figure as it revolves thereunder so as to give the appearance that the figure is jumping over the rope. Additionally, slide means may be provided whereby the intermediate figure slides from the top of the slide means to its jumping position and then begins to jump rope.

3,721,042
TOY VEHICLE WITH ADJUSTABLE BODY
Gabriel Marason, Jr., Los Angeles, Calif., assignor to Mattel, Inc., Hawthorne, Calif.
Filed March 1, 1971, Ser. No. 119,974
Int. Cl. A63h *17/26*
U.S. Cl. 46—223 5 Claims

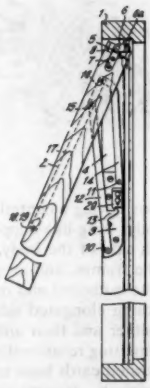


A toy vehicle having a chassis including two upstanding spring members which are received by two sleeves of the vehicle's body so as to cause a frictional engagement when the body and chassis are brought together. The frictional engagement allows an operator to place the body in any one of various positions relative the chassis thereby simulating real hot rod type auto-mobiles in a very simply constructed yet ruggedly built toy.

3,721,043
PROCESS FOR THE IMPROVEMENT OF THE CONSTITUTION OF SOILS
Guy Camille Van Doorne, Zellik, Belgium, assignor to Labofina S.A.
Filed Oct. 27, 1971, Ser. No. 192,989
Int. Cl. A01b *79/00*
U.S. Cl. 47—58 8 Claims

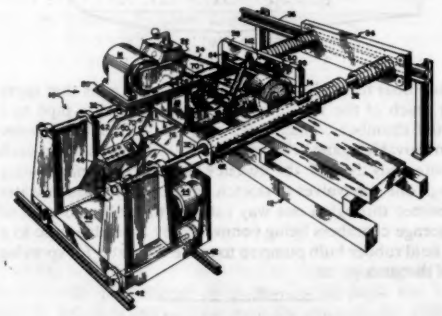
A process for the improvement of the constitution of soils, which comprises incorporating into said soils an aqueous emulsion of bitumen containing a non-ionic surface-active compound and an anionic surface-active compound.

3,721,044
HINGE MEANS FOR REVERSIBLE WINDOWS
Harald Kvasnes, Vegsund, Norway, assignor of a fractional part interest to A/S Spilka, Spjelkavik, Norway
Filed June 3, 1971, Ser. No. 149,696
Claims priority, application Norway, June 4, 1970, 2,180/70
Int. Cl. E05d *15/28*
U.S. Cl. 49—248 3 Claims



A hinge means for windows permitting positioning of the sash in various positions and also reversal of the sash.

3,721,045
PRESSURE CONTROL SYSTEM FOR A GRINDING MACHINE AND ACTUATING UNIT THEREFOR
Robert J. Wojcik, Melrose Park, Ill., assignor to Pettibone Corporation, Chicago, Ill.
Division of Ser. No. 869,071, Oct. 24, 1969, Pat. No. 3,614,351. This application March 26, 1971, Ser. No. 128,254
Int. Cl. B24b *7/02*
U.S. Cl. 51—35 5 Claims



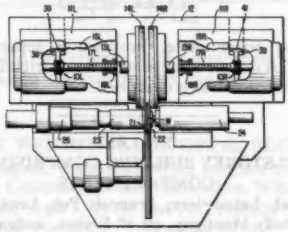
A pressure control system for regulably bleeding the applied fluid pressure on a grinding wheel to vary the contact pressure of the wheel on the work. A novel control unit having a manipulating handle functions initially to establish an electric circuit through the solenoid winding of a directional valve so as to apply contact pressure to the grinding wheel, the handle functioning thereafter to regulate the flow of fluid through a bleed valve which reduces the contact pressure by an amount proportional to the forward throw of the handle.

3,721,046

HORIZONTAL DISC GRINDER WITH EQUAL FEED CONTROL FROM WORKPIECE CONTACT

Elman R. Dunn, Roscoe, Ill., assignor to Litton Industries, Inc., Beverly Hills, Calif.

Filed July 2, 1970, Ser. No. 51,860
Int. Cl. B24b 7/04
U.S. Cl. 51—118 6 Claims



An automatic feed apparatus for a horizontal disc grinder is used to effect equal and/or unequal movement of opposed grinding discs (14L, 14R) as required by grinding stock location, to remove an equal amount of stock from the parallel surfaces (21, 22) of disc-type workpieces (W). A face cut feed system is hydraulically operated to effect first a rapid movement in unison of two grinding heads (11L, 11R) until one or the other disc contacts the workpiece (W), then the movement of each grinding head (11L, 11R) is controlled in response to sequential contact of the discs (14L, 14R) with the corresponding sides (21, 22) of the workpiece (W). Individual motor load sensors (1MLS, 2MLS) actuate motor load relays (1CRE, 2CRE) which are used to control first a sequential momentary stoppage in feed movement of first one and then the other grinding head followed by resumption of further infeed in unison at a slow grinding feed rate, following a momentary controlled time delay. Following the timed delay, an equal amount of stock is removed from each parallel surface (21, 22) of the workpiece (W) as determined by a metered volume of fluid which is discharged from a single displacement cylinder (64), which permits an equal infeed movement to occur in each grinding head (11L, 11R).

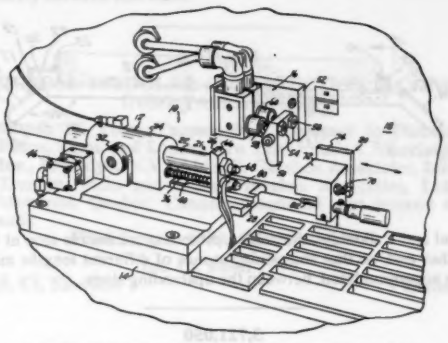
3,721,047

CRUSH DRESSING CONTROL MECHANISM

Merle E. Ryan, and William D. Stremel, both of Dayton, Ohio, assignors to The Bendix Corporation, Southfield, Mich.

Filed July 6, 1971, Ser. No. 159,941
Int. Cl. B24b 49/18
U.S. Cl. 51—165.78 4 Claims

A mechanism for controlling the infeed point at which the crush dressing sequence occurs for grinding machines including a position referencing rod slidably fitted in a base with a friction snubbing means preventing free motion therein and positioned by a driving engagement with the wheelhead during infeed motion, and an arrangement producing reduction of the wheelhead infeed to the crush feed rate after a predetermined extent of relative motion therebetween, combined with a spring biased pin slidable in the base and fixed during crush cycling, and controlling the depth of crush by an agreement which discontinues the low speed traverse after a predetermined extent of relative motion between the wheelhead and the pin, thereafter the pin being relocated on a plate carried by the position referencing rod. By this arrangement, the wheelhead returns to the point of the previous crush cycle at a



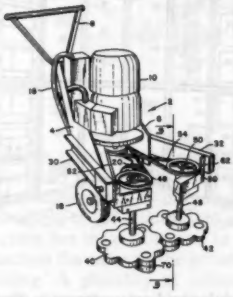
rapid traverse infeed while the crush depth of each cycle remains the same.

3,721,048

MACHINE FOR POLISHING MASONRY FLOORS

Sidney Rand, Rio Piedras, P.R., assignor to The Goverment of the Commonwealth of Puerto Rico, as representative of all the People of Puerto Rico

Filed Oct. 26, 1971, Ser. No. 192,197
Int. Cl. B24b 23/00
U.S. Cl. 51—174 5 Claims



A wheeled carriage carries an electric motor the shaft of which is connected by belts to drive two vertical driven shafts in opposite directions. Meshing gear-shaped polishing wheels on the lower ends of these shafts have abrasive stones on their lower surfaces. The shafts extend through pillow blocks which are mounted on arms extending from the carriage, the support for each pillow block being in the plane of the associated driving belt to prevent turning moments from being exerted on the driven shafts by the belts. The wheels may be adjusted toward and away from the polishing wheels to vary the pressure of the abrasive stones on the floor.

3,721,049

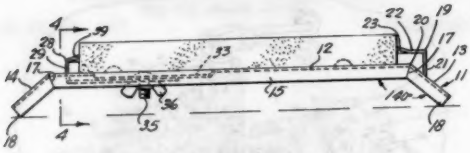
BASE FOR WHETSTONE

Mitsue Nakahara, 1715 Hart Street, Apt. 4, Honolulu, Hawaii

Filed July 2, 1971, Ser. No. 159,286
Int. Cl. B24d 5/00, 7/00
U.S. Cl. 51—211 R 9 Claims

A supporting base for a sharpening stone consisting of an elongated downwardly facing channel having downwardly inclined end portions presenting sharp corners at their bottom ends adapted to penetrate the surface of a work bench. The

channel has a pair of spaced upstanding stops along one longitudinal margin, an upstanding fixed transverse stop at one



end and a slidably adjustable upstanding transverse stop at its other end, so that sharpening stones of different lengths may be accommodated, between the upstanding stops.

3,721,050

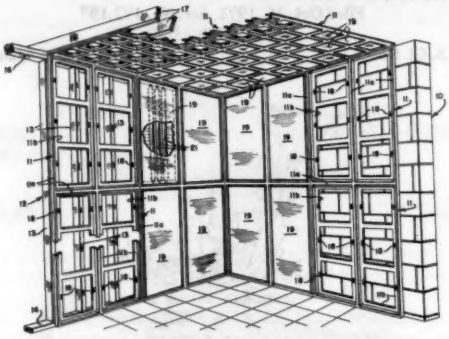
MODULAR GRID PANEL RETENTION SYSTEM

Joseph Perina, Huntington, N.Y., assignor to American Velcro, Inc., Manchester, N.H.

Continuation-in-part of Ser. No. 853,657, Aug. 28, 1969, abandoned. This application Sept. 15, 1971, Ser. No. 180,669

Int. Cl. E04b *5/57*

U.S. Cl. 52—28 **7 Claims**



An integral modular grid arrangement is disclosed for supporting a series of modular panels, such as wall or ceiling panels or tiles. The grid may be attached to wall or ceiling structure. Both the grid and panels are equipped with quick connect and disconnect hook and loop type fastener strips which permit the panels to be quickly installed and removed to provide access to lighting which may be installed behind the panels or grid.

3,721,051

BOTTOMLESS SUB-ASSEMBLY FOR PRODUCING AN UNDERFLOOR ELECTRICAL CABLE TRENCH

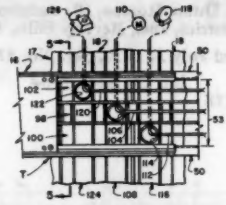
Frank W. Fork, Allison Park, Pa., assignor to H. H. Robertson Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 71,494, Sept. 11, 1970, abandoned. This application July 1, 1971, Ser. No. 158,769

Int. Cl. E04f *17/08, 19/08*

U.S. Cl. 52—173 **16 Claims**

A bottomless sub-assembly installed over metal cellular flooring and enclosing an upper surface portion of the flooring. The upper surface portion cooperates with the sub-assembly to create a structure which may be described as an underfloor electrical cable trench. The upper surface portion may be exposed to view by removing a cover plate of the sub-assembly. Vertically adjustable conduit means positioned



beneath the cover plate, provides a separate enclosed passageway. A unique arrangement for distributing multi-conductor telephone cables is described.

3,721,052

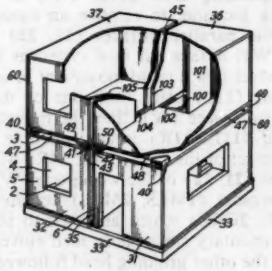
MULTI-STOREY BUILDING COMPRISING UNIT COMPARTMENTS

Charles Boel, Labuissiere; Francois Pot, Lens, and Claude Sachot, Bully-Montigny, all of France, assignors to Houilleres Du Bassir Du Norde & Du Pas-DE-Calois, Douai (Nord), France

Filed May 4, 1970, Ser. No. 34,069

Int. Cl. E04h *1/04*

U.S. Cl. 52—79 **9 Claims**



Multi-storey buildings comprising unit compartments which can be completely constructed in the factory and easily transported, comprising ceiling and floor slabs and side walls made of reinforced concrete, characterized in that:

the compartments have side walls which are shells of reinforced concrete between 3 and 8 cm thick and preferably between 4 and 6 cm thick;

the side walls are bolted to each other and to the ceiling and floor slabs;

and the compartments of the bottom storey comprise suitably disposed breastsummers of suitable dimensions which bear at least one storey of compartments of the same kind.

3,721,053

ADJUSTABLE JOINT BETWEEN PANEL FRAMES

Albert I. Geyser, Pittsburgh, Pa., assignor to E. K. Geyser Company, Pittsburgh, Pa.

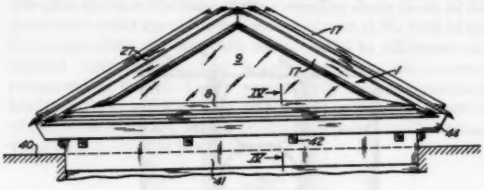
Filed Mar. 1, 1971, Ser. No. 122,593

Int. Cl. E04b *7/18*

U.S. Cl. 52—82 **6 Claims**

Each of a pair of frames has a side member with an outwardly opening channel provided with parallel side flanges having transversely arcuate inner surfaces extending length-wise thereof. These side members are disposed in spaced parallel relation. A joint member extends length-wise of each channel and is rotatably mounted therein, while a rigid connecting strip extends along each joint member and is joined to it. The strips project laterally between the joint members in overlapping relation to close

the space between the frames. The connecting strips are held against lateral movement across each other. By rotating at least one of the frames on the joint member therein, the angle between the two frames can be changed.



3,721,054

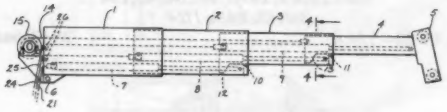
LIGHT WEIGHT TELESCOPING BOOM

John T. Hornagold, Waukesha, Wis., assignor to Bucyrus-Erie Company, South Milwaukee, Wis.

Filed Sept. 7, 1971, Ser. No. 178,027

Int. Cl. E04h *12/34*; B66f *3/24*

U.S. Cl. 52—115 **7 Claims**



A multi-section telescopic boom has a separate, single acting hydraulic cylinder for extending each movable section and a single cable for retracting all of the sections. The outermost sections have support feet at their inner ends which straddle the cylinders for the next inner sections, thus eliminating guard partitions. A bidirectional flow divider system is used to synchronize extension and retraction of the several sections, and pressure relief valve in the system allow for resynchronization.

3,721,055

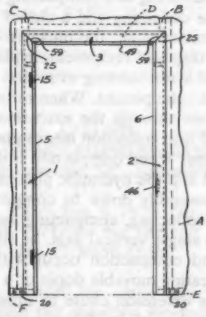
DRYWALL DOOR FRAME

Lewis A. Jerchower, Paramus, N.J., assignor to Pioneer Industries, Division of SOS Consolidated Inc., Carlstadt, N.J.

Filed March 14, 1969, Ser. No. 807,238

Int. Cl. E06b *1/04*

U.S. Cl. 52—217 **1 Claim**



The present metal frame has a hinge jamb, strike jamb, and a head which lock together in place over finished drywalls and said jambs each includes an anchor adjustably carried from the exterior of the jamb for tightening the anchor against the frame studs of a drywall until the door frame is positioned securely between said studs.

3,721,056

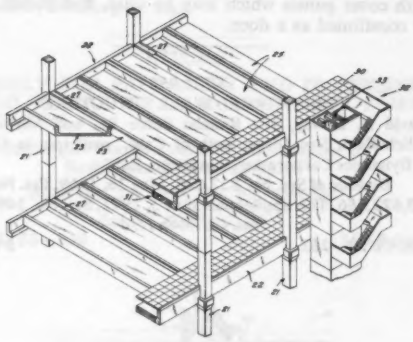
VERTICAL MODULAR CONSTRUCTION HAVING INSERTABLE UNITS

Danforth W. Toan, Tappan, N.Y., assignor to Warner, Burns, Toan, and Lunde, New York, Node 4 Associates, Inc., Brooklyn, N.Y., Alvin E. Gershen Associates, Inc., Trenton, N.J., and Robert Hughes Associates, Ltd., Montreal, Quebec, Canada, fractional part interest to each

Filed Sept. 3, 1970, Ser. No. 69,303

Int. Cl. E04h *1/04*

U.S. Cl. 52—236 **9 Claims**



A modular frame system capable of being constructed in both a vertical and horizontal direction to a predetermined size and configuration. A plurality of spaced land structures in vertically tiered relationship are provided and each land structure has means thereon to permit the land structure to function the same as the ground surface structure of a building. A plurality of substantially vertical columns extend upwardly from the ground and the columns have beams thereon to support the vertically spaced land structures. The land structure and column support assemblies are adapted to receive at least one insertable core unit between each pair of spaced land structures in a manner that will permit each vertically inserted core unit to be connected to a land structure in the same manner as it would normally be connected to the ground surface.

3,721,057

PARTITION WALL

Bert Lieber, Stuttgart-Birkach, Germany, assignor to Ernst Last K.G., Lampertsheim, Germany

Continuation of abandoned application Ser. No. 788,771, Jan. 3, 1969. This application Jan. 19, 1971, Ser. No. 107,867

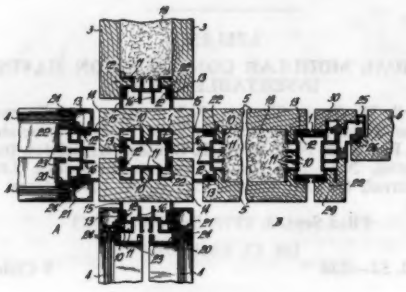
Claims priority, application Germany, Jan. 20, 1968, P 16 58 915.4

Int. Cl. E04b *2/76*

U.S. Cl. 52—241 **17 Claims**

A partition wall is provided which has box shape columns slidably mounted on securing members fixed

to the ceiling and wall, the columns being secured in place by detachable engagement, at opposite sides thereof,

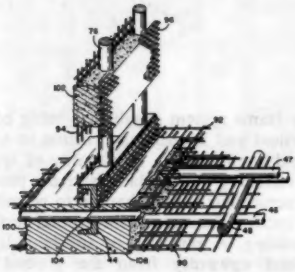


with cover panels which may be solid, transparent, fixed or constituted as a door.

3,721,058
REINFORCED WALL STRUCTURE

David B. Dewey, Jr., Rancho Sante Fe, and Norman W. Schofield, San Diego, both of Calif., assignors to General Dynamics Corporation, San Diego, Calif.

Division of Ser. No. 827,636, May 26, 1969, Pat. No. 3,622,656. This application June 3, 1971, Ser. No. 149,576
Int. Cl. E04b *1/16*
U.S. Cl. 52—251 5 Claims



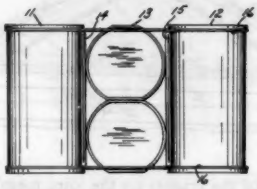
A large buoy construction of relatively thin wall composite material, which walls are integrally formed and interconnected by a reinforcing matrix frame comprising reinforcing members sandwiched between layers of screens, to which the cement type material can be applied by use of power equipment in a rapid application and thorough penetration into the matrix to accomplish on-site formless molding of integral, unitary structures having complex shapes and junctions.

3,721,059
BUILDING BLOCK OF EMPTY CANS

Michael E. Reynolds, P.O. Box 1041, Taos, N. Mex.

Filed Nov. 1, 1971, Ser. No. 194,114
Int. Cl. E04c *1/06*
U.S. Cl. 52—750 4 Claims

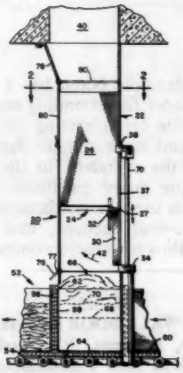
A building element or block consisting of empty substantially uniformly sized cans which are assembled in a wall-like structure using mortar joints and without the necessity of embedding the cans in concrete or other cementitious material. Each element consists of first and second pairs of cans standing in a first direction, a third pair of cans disposed intermediate said first and second pairs, the principal axes of which are at right angles with respect to those of said first and second pairs. A seventh can is reduced to flattened condition and positioned between said first mentioned and third mentioned pair of cans, and an eighth can is similarly flattened to be positioned between said second pair and said third pair to serve as weather stops. The assembled element is maintained in such condition by wire cinctures held in position by the rims of said first and second pairs of cans.



3,721,060
REFUSE COMPACTING DEVICE

Mario J. Quinto, 70 Dannell Drive, Stamford, Conn.

Filed June 3, 1970, Ser. No. 43,154
Int. Cl. B65b *1/24*
U.S. Cl. 53—124 B 29 Claims



A refuse compactor easily positioned under existing refuse chutes and allowing the refuse collecting, compacting and packaging steps to be performed along a single vertical axis. The compactor incorporates at least one horizontally disposed movable door functioning as a compacting ram, with an open position for refuse collecting and a closed position for compacting. In one embodiment, the movable door is supported by two vertically disposed reciprocating plates slidable along the inside walls of a surrounding extension chute. The plates are driven by hydraulic pistons. When refuse is dropped into the chute, it passes through the extension chute, the open movable door and into collection means placed at the base of the extension chute. When compaction is desired, the movable door is closed and the hydraulic pistons draw the vertical plate and door assembly down to compact the refuse collected. Thus the collecting, compacting and packaging steps all occur along a single vertical axis. In other embodiments, the collection and compaction occur within the extension chute by incorporating movable doors or a movable platform at the base of the extension chute to substantially close the chute and collect the refuse. When compaction is desired, similar horizontally disposed vertically reciprocating movable doors are used to effectuate the compaction. When the desired amount of refuse has been compacted, the movable

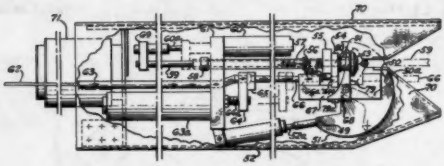
doors at the base of the extension chute open and allow the compacted refuse to drop into collection means at the base of the extension chute or the platform is drawn downward supporting the compacted refuse. In a further embodiment, movable doors at the base of the extension chute serve as the press head while the collection means placed at the base of the extension chute are vertically reciprocated to effectuate the desired compaction. The compactor also incorporates reciprocating flexible fins or permanently mounted sawtooth blades in the extension chute or mounted in the existing refuse chute to destroy any refuse bridge and substantially reduce any refuse buildup or jamming.

3,721,061

AUTOMATIC BAG NECK GATHERER AND TYING MECHANISM

William A. Bodolay, 15 Fernglen Road, East Longmeadow, Mass.

Filed June 14, 1971, Ser. No. 152,777
Int. Cl. B65b 7/12
U.S. Cl. 53—135 **24 Claims**



This invention is concerned with the subject matter of placing a tie upon the neck of a bag that has previously been filled. The bags for which this particular device is designed are the type that utilize food stuffs, particularly popcorn, potato chips, apples, oranges, onions and the like. There is a source of tie wire which is free mounted. The wire is fed through certain tubes that are strategically located in designated areas. The wire that is pulled through the tubes is bent. One of the tubes is moveable and because the wire is bent, the wire can be pulled from its source through the fixed tube. There is a spinning type of knife which cuts off a segment of the wire. The cut off wire is then wrapped around the neck of the bag. The neck of the bag is squeezed together by the mechanism. There is a control circuit electrically operated for synchronizing the various function of the device. In the preferred embodiment, pneumatic cylinders are employed for actuating the mechanism. The device has been particularly designed to operate with a filled bag on the Bodolay bag making and feeding machine known as U.S. Pat. No. 2,877,609. There is a tying mechanism that takes the cut wire and wraps around the neck of the bag and the spinner mechanism twists it twice after the neck of the bag has been squeezed snugly together.

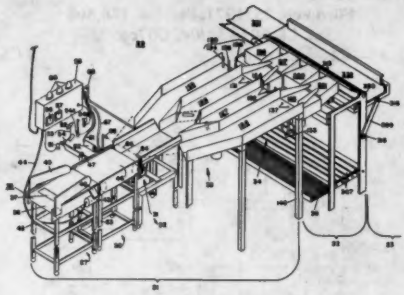
3,721,062

BAG PACKAGING SYSTEM

John T. Roberts, Simpsonville, S.C., assignor to W. R. Grace & Co., Duncan, S.C.

Division of Ser. No. 9,869, Feb. 9, 1970. This application Sept. 20, 1971, Ser. No. 182,162
Int. Cl. B65b 43/36
U.S. Cl. 53—385 **2 Claims**

Apparatus and method for classifying products to be packaged, distributing the classified products to index positions corresponding to their classifications and holding the classified products for packaging, indexing bags into produce loading positions corresponding to the index positions by conveying imbricated taped bags into loading positions keyed to the classifications, inflating the taped bags, inserting the indexed items into the bags and removing the loaded bags from



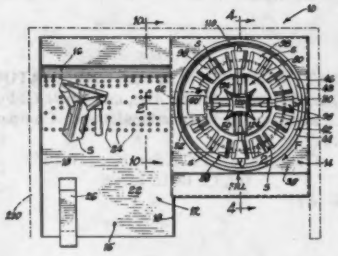
the loading position, conveying the loaded bags to an evacuating and closing position, evacuating and closing the bags and subsequently shrinking the bags.

3,721,063

ASSEMBLY FOR PACKAGING AND DISPENSING FOOD PRODUCTS, SUCH AS FRENCH FRIED POTATOES

Ralph E. Weimer, Lombard, Ill., assignor to Restaurant Technology, Inc.

Filed Oct. 12, 1971, Ser. No. 188,349
Int. Cl. B65b 67/00
U.S. Cl. 53—390 **16 Claims**



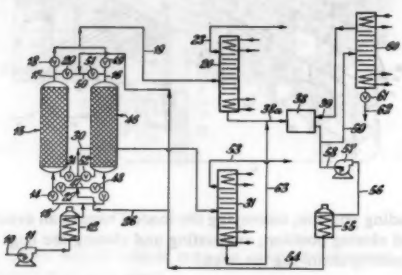
A packaging and dispensing assembly for segmental food products, such as french fried potatoes. A packaging section and a dispensing section are juxtaposed and are interconnected via a chute leading from the dispensing section to the packaging section whereby french fried potato segments spilled into the dispensing section may be promptly returned to the packaging section. The packaging section includes a trough defining a base opening in communication with the chute and a carousel means which is rotatable with respect to the trough. The carousel means provides a series of generally pocket-like package holding sections which nestingly receive and hold packages of the product. The carousel means rotates to encourage removal of a first-in package and to indicate visually with is the first-in package. The carousel may rotate unidirectionally. The carousel may also mount sweeper elements depending into the trough for carrying spilled french fried potato segments to the trough base opening for return to the packaging section through the chute.

3,721,064

ISOTHERMAL PROCESS FOR OLEFIN SEPARATION

Martin F. Symoniak, Mahopac, and Max N. Y. Lee, Yorktown Heights, both of N.Y., assignors to Union Carbide Corporation, New York, N. Y.

Filed Feb. 25, 1971, Ser. No. 118,608
Int. Cl. B01d *53/04*; C07c *9/02*
U.S. Cl. 55—62 3 Claims



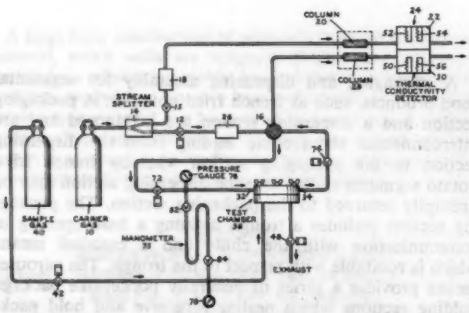
Straight-chain and branched-chain monoolefins are separated by size selective molecular sieving in a vapor phase, isobaric, isothermal fixed bed process employing adsorption co-purge and countercurrent purge steps in cyclic sequence. The process utilizes a paraffinic hydrocarbon of higher carbon number than the olefin for the purge which permits distillation recovery of the separated olefins from the purge paraffin which is recycled. The straight chain paraffin content of the purge is greater than the straight chain olefin content of the feed whereby the molecular sieve is at least partially loaded with straight chain paraffin during all steps of the process.

3,721,065

BARRIER ATTACHMENT FOR GAS CHROMATOGRAPH

Thomas A. Robicheaux, Mobile, Ala., and Clyde G. Ford, Dallas, Tex., assignors to International Paper Company, New York, N.Y.

Filed Jan. 27, 1971, Ser. No. 110,146
Int. Cl. B01d *15/08*
U.S. Cl. 55—67 1 Claim



An apparatus integrated with a detection system of the type that establishes individual components in a sample gas mixture by the thermal conductivity thereof, which establishes the gas transmission rate of the sample gas through a given material. Sample gas is fed into a first cavity of a partitioned chamber and diffuses through the partition into a second cavity of the partitioned chamber. Diffused gas is swept from the second cavity with inlet carrier gas to a thermal conductivity detector in the detection system for analysis.

3,721,066

PROCESS FOR RECOVERY OF ACID GASES

Aaron J. Teller, Great Neck, N.Y., assignor to Teller Environmental Systems, Inc., New York, N.Y.

Filed Dec. 29, 1970, Ser. No. 102,561
Int. Cl. B01d *53/04*
U.S. Cl. 55—71 10 Claims

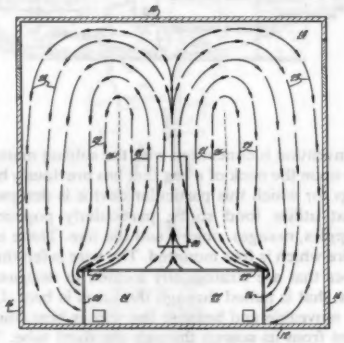
A process for removing an acid gas component from a gas stream is shown. The gas is passed in contact with finely divided nepheline syenite which selectively sorbs acid components such as hydrogen fluoride, sulfur dioxide and silicon tetrafluoride from the gas. The nepheline syenite is desirably treated with water to increase its sorbant characteristics.

3,721,067

CLEAN AIR SYSTEM FOR HOSPITAL OPERATING ROOMS

Boyd F. Agnew, 111 Via Lido Nord, Newport Beach, Calif.

Continuation-in-part of Ser. No. 88,667, Nov. 12, 1970, abandoned. This application Sept. 1, 1971, Ser. No. 176,909
Int. Cl. B01d *46/00*
U.S. Cl. 55—97 26 Claims



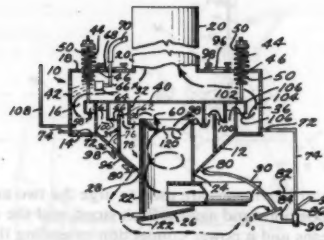
Two relatively shallow floor to ceiling cabinets are located against one end wall of a hospital operating room and extend side by side along the wall for a major portion of the room width. Each cabinet is provided with a bank of filters encompassing substantially its entire frontal extent and includes a pressurized plenum chamber behind the filters, coextensive therewith. Blowers mounted within the cabinets pressurize the plenum chambers to direct a laminar horizontal flow of clean air through the filters and thence over an operating table positioned near the end wall. A pair of full height but narrow deflecting vanes extend from opposite outboard ends of the cabinets across the face of the filters at an acute angle therewith. The vanes narrow the outflowing stream, increase its velocity, improve its cross-sectional configuration, and help to separate and isolate the cabinet air intakes. The clean air stream extends from the operating room floor substantially to the ceiling and has a width sufficient to envelope not only the operating table but also persons standing and working alongside the table. Air is returned to the cabinets along relatively narrow portions of the room at opposite sides thereof and withdrawn from the room into the blowers through prefilters mounted on oppositely disposed outboard end walls of the cabinets that are positioned to face opposite side walls. Outflowing clean air is balanced against return air streams.

3,721,068

GAS STREAM SCRUBBER

Dan B. Vincent, P.O. Box 5478, Tampa, Fla.

Filed Feb. 1, 1972, Ser. No. 222,628
Int. Cl. B01f *3/04*
U.S. Cl. 55—223 4 Claims



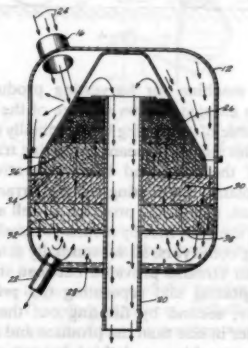
There is disclosed a countercurrent system, for instance for removing particles, such as fish solids, citrus pulp and other dust particles or syrupy droplets, from the exhaust gases from a dryer or the like. The system includes a vessel provided with coaxially interdigitated upper and lower baffles which control a countercurrent flow of the washing liquid and gas stream. The baffles are of graduating heights and the upper set "-floats" at a level determined by the pressure within the vessel. The washing liquid with entrained gas assists in cleansing the baffles. Cleaning ports may also be provided.

3,721,069

AIR-OIL SEPARATOR

Robert A. Walker, 17130 Roscoe Boulevard, Northridge, Calif.

Filed Aug. 10, 1970, Ser. No. 62,544
Int. Cl. B01d *50/00*
U.S. Cl. 55—319 14 Claims



A device suitable for use with internal combustion engines for separating oil from an air-oil mixture expelled from the engine. The device utilizes a baffle for producing primary separation of oil from the mixture and subsequently causes the mixture with any retained oil to be driven through filtration material. An inlet orifice in the device of a first size is provided ultimately communicating with an outlet orifice in the device of second and greater size to further contribute to separation of the oil. A reservoir at the bottom of the device receives the oil for transmission back to the crankcase, oil pump, etc. of the engine.

3,721,070

METHOD AND APPARATUS FOR PRODUCING YARNS BY THE OPEN-END SPINNING SYSTEM

Keiichi Minami, Tokuji Nakaue, Kozo Susami, Tabata Masaaki, Otsu; Masakazu Hirota, all of Shiga, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Apr. 13, 1970, Ser. No. 27,509
Claims priority, application Japan, Apr. 14, 1969, 44/28231; Sept. 17, 1969, 44/73408; Feb. 2, 1970, 45/8601; Feb. 2, 1970, 45/8602
Int. Cl. D01h *1/12*
U.S. Cl. 57—58.95 6 Claims

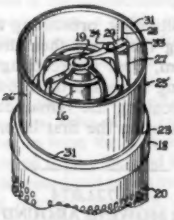
Open-end spinning method and apparatus utilizing a spinning rotor, wherein, fibers of the textile staple material are separated from a fiber bundle due to a mechanical pulling-out action created by a pair of rotating rollers which operate at a very high peripheral speed and simultaneously, the separated fibers are fed directly or through a guide member to a collecting surface of the spinning rotor mainly by the inertia of each individual fiber.

3,721,071

SEALED AND GROUNDED ELECTRIC MOTOR HOUSING

Helmut Mueller and Lawrence N. Purcell, both of P.O. Box 482, Palatine, Ill. 60067

Filed Aug. 20, 1971, Ser. No. 173,566
Int. Cl. B01d *46/42*
U.S. Cl. 55—360 6 Claims



An electric motor housing for a vacuum type apparatus that requires the motor to be sealed against dirt, dust, and debris and completely electrically grounded, including a filter support mounted upon an electric motor which is in turn confined within a metal protective sleeve including peripheral gaskets for sealing the sleeve between the motor casting and the apparatus cover, with the sleeve providing an integral yieldable grounding lug for connection to the motor and grounding wire of the electrical supply cord.

3,721,072
BONDED ACTIVATED CARBON AIR FILTER

Thomas Miller Clapham, Pittsburgh, Pa., assignor to Calgon Corporation, Pittsburgh, Pa.

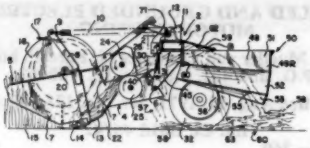
Filed July 13, 1970, Ser. No. 54,307
Int. Cl. B01d 53/02
U.S. Cl. 55—387 8 Claims

A filter for removing odors, hydrocarbons, and other contaminants from air comprising activated carbon granules bonded together into a monolithic extended surface shape in the form of a wave. This type of filter is particularly useful in air handling systems where pressure drop is critical.

3,721,073
METHOD OF PROCESSING, POSITIONING AND AERATING CROPS

Thomas J. Scarnato, Barrington, Peter J. Peacock, Western Springs, George B. Cicci, Broadview, Paul W. Krage, Elmhurst, and John J. Kowalik, Glenview, Ill., assignors to International Harvester Company, Chicago, Ill.

Original application Dec. 16, 1970, Ser. No. 98,497. Divided and this application Apr. 10, 1972, Ser. No. 242,547
Int. Cl. A01d 43/10
U.S. Cl. 56—1 10 Claims



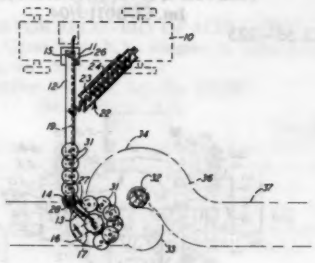
A method of positioning, processing and aerating crops comprising crushing the crops then discharging them in high velocity stream, then intercepting a portion of the stream and deflecting it toward the ground to form a first layer and then depositing the remainder of the crops in one or more layers upon the first layer in a fluffy swath or windrow.

3,721,074
MOWER FOR MOWING AROUND AN OBJECT

Sherman C. Heth, Sturtevant, Wis., assignor to Jacobsen Manufacturing Company, Racine, Wis.

Filed Feb. 16, 1972, Ser. No. 226,761
Int. Cl. A01d 35/26
U.S. Cl. 56—10.4 5 Claims

A mower for mowing around an object such as a tree or post, and including a mobile support having a first arm pivoted thereon and extending laterally therefrom, and a second arm pivoted on the extending end of the first arm and extending laterally and forwardly of the first arm. A cutter is supported on the extending end of the second arm and is positionable on the far side of a tree or post or the like when the support is moved forward, and the cutter, by virtue of the articulation in the first and second arms, is movable in a circle around the post or tree or the like as the mobile support advances past the

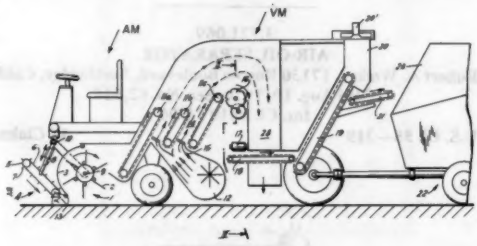


object. Springs or like means are used to urge the two arms in their forward positions and against limit stops, and the cutter has a drive means and a power connection extending thereto for powering the cutter.

3,721,075
STRIPPING MACHINE

Rudiger Welberg, Braunschweig, Germany, assignor to Maschinenfabrik August Herbort, Braunschweig, Germany

Continuation-in-part of Ser. No. 77,264, Oct. 1, 1970. This application July 13, 1971, Ser. No. 162,040
Claims priority, application Germany, Aug. 6, 1970, G 70 29 548.6
Int. Cl. A01d 55/26, 45/22
U.S. Cl. 56—13.5 13 Claims



A picking machine for harvesting produce from plants which grow in elongated rows and are of the bush variety. A vehicle is capable of advancing longitudinally of the respective rows and carries stripping means extending transversely to the elongation of the rows and being operative for stripping produce off plants. Separating means, arranged behind the stripping means, admits the produce as well as foreign matter and separates the two, first by means of a series of rearwardly rising cleaning conveyors, all substantially arranged in parallel planes, with air streams provided between the cleaning conveyors for agitating and separating the produce from the foreign matter, second by filtering out the foreign matter which is greater in size than the produce and expelling it from the harvesting machine, and third by removing, by suction means, that foreign matter which is lighter in weight than the produce.

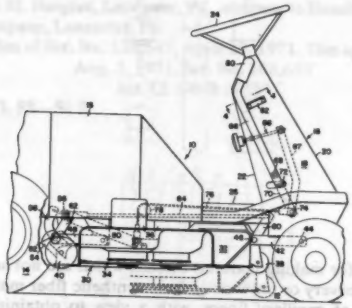
3,721,076
ADJUSTABLE MOWER SUSPENSION SYSTEM

Robert Nick Behrens, Horicon, Wis., assignor to Deere & Company, Moline, Ill.

Filed Oct. 4, 1971, Ser. No. 186,243
Int. Cl. A01d 35/26
U.S. Cl. 56—14.9 9 Claims

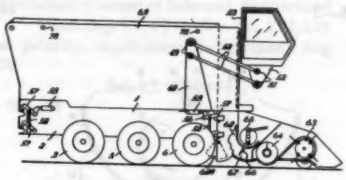
An electric drive riding lawn mower includes a pair of electrically driven rear drive wheels and steerable front wheels

controlled by a steering wheel mounted in an upright supporting structure at the forward end of the machine. A rotary mower unit is suspended from the main frame between the front and rear wheels and includes a generally horizontal housing connected to the main frame by front and rear links which permit the vertical movement of the mower unit between a lowered operating position and a raised transport



position. The position of the mower unit is controlled by a lever pivotally mounted alongside the support structure and connected to the mower unit by a cable, the control lever being lockable in a rearward position wherein it maintains the mower unit in its raised position, and swingable forwardly to lower the mower unit. An adjustable stop limits the forward movement of the control lever to establish the lowermost, operating position of the mower unit.

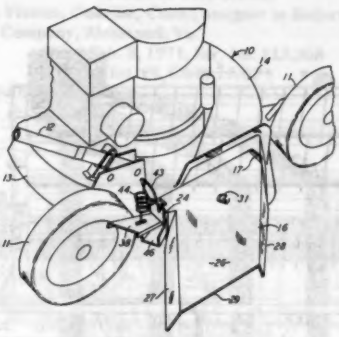
3,721,077
TRACTORS
Cornelis van der Lely, 7, Bruschenrain, Zug, Switzerland
Filed Oct. 3, 1969, Ser. No. 863,486
Claims priority, application Netherlands, Oct. 7, 1968, 6814307
Int. Cl. A01d *75/22*
U.S. Cl. 56—15.6 **16 Claims**



A tractor includes a frame on wheels and a driver's platform which is adjustably connected to the tractor and movable relative to the frame so that various implement attachments can be placed on the upper surface of the tractor at least partly above the frame. Coupling members, including lifting cylinders are connected to the frame to position and secure the attachments to the tractor.

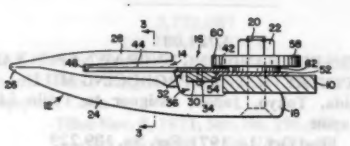
3,721,078
PEDAL CONTROLLED HINGED CHUTE FOR LAWN MOWERS
Donald G. Haffner, Greendale, Wis., assignor to Jacobson Manufacturing Company, Racine, Wis.
Filed June 19, 1972, Ser. No. 263,781
Int. Cl. A01d *35/22*
U.S. Cl. 56—202 **7 Claims**

A pedal controlled hinged chute for lawn mowers of the rotary type having a housing and a lateral discharge for the grass clippings. A chute is hingedly mounted on the housing on a horizontal axis and moves between a horizontally extended position and a raised position which exposes the mower discharge outlet. A foot pedal is pivotally mounted on the mower and through a spring it is connected to the hinged chute such that depressing the pedal causes the chute to move upwardly and expose



the outlet and permit mounting a grass catcher bag on the mower housing. A stop is on the housing to limit the downward movement of the pedal, and a fastener extends between the chute and the housing to releasably hold the chute in its downward position.

3,721,079
MOWING APPARATUS
Donald E. Burrough, West Bend, Wis.; Wilfred Lee Roy Steuerwald, and Bobby Gene Sawyer, both of Ottumwa, Iowa, assignors to Deere & Company, Moline, Ill.
Filed Aug. 12, 1971, Ser. No. 171,192
Int. Cl. A01d *55/08*
U.S. Cl. 56—305 **10 Claims**

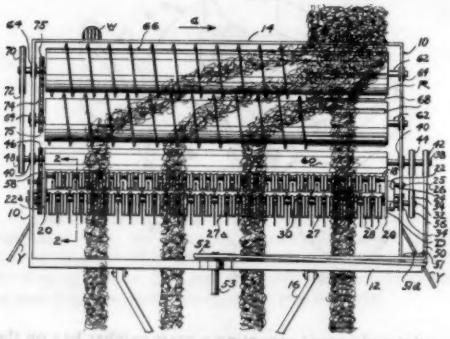


Mowing apparatus of the reciprocating sickle type including an elongated support beam, a sickle guard mounted on the beam and extending forwardly therefrom, and a sickle bar having a plurality of sharpened knife sections reciprocable through a horizontal slot formed in the guard. The guard includes a lip portion and a body portion, the former overlapping the longitudinal sides of the latter and being spaced vertically therefrom to form the horizontal slot in the guard. Material being mowed is thus inclined transversely outwardly from the sides of the guard and assists in maintaining the sickle in proper cutting relation therewith. The sickle is further maintained in position by means of a circular plate member mounted on the support beam directly behind the lip portion of the guard and overlying the rear edge portion of the sickle.

3,721,080
CROP WINDROWING APPARATUS
Preston L. Marsh, Route 1, Hope, Mich.
Filed Oct. 2, 1970, Ser. No. 77,428
Int. Cl. A01d *89/02*
U.S. Cl. 56—364 **22 Claims**

Apparatus for windrowing crops including a rotatable tine assembly for lifting severed crops and moving them rear-

wardly over a stripper drum rotatably mounted about an axis offset from the rotational axis of the tine assembly and which strips the crops from the tine assembly and propels them further rearwardly onto conveyor mechanism that gathers the crops and discharges them at the rear of the machine in a windrow. In one embodiment, the drum and tine assembly are individually driven and the drum is provided with a plurality of curvilinear grain collecting troughs which are mounted on longitudinally extending, circumferentially spaced support bars having openings therebetween for receiving the individual tines of the tine assembly. In a modified embodiment, the tine assembly drives the drum.



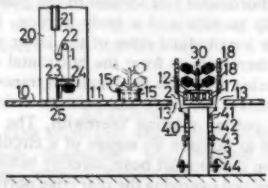
ERRATUM

For Class 57—58.95 see:
Patent No. 3,721,070

3,721,081
APPARATUS FOR HANDLING UNDRAWN SPUN YARN IN SYNTHETIC YARN PRODUCING MILL

Kinyu Ishida, Tokyo, Japan, assignor to Teijin Limited, Tokyo, Japan

Filed Oct. 14, 1971, Ser. No. 189,229
Int. Cl. D01h *9/18*
U.S. Cl. 57—34 R 9 Claims

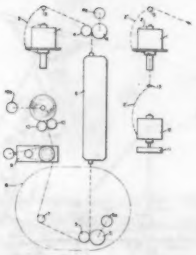


A take-up winder for undrawn spun yarn is set up on a floor, while a yarn-drawing machine is installed under the floor. The floor is provided with an opening through which the undrawn yarn loaded upon a creel, which is set up substantially on the same level as said floor, is supplied to the yarn-drawing machine under the floor.

3,721,082
PROCESS FOR MAKING TEXTURED THREADS WITHOUT TWIST RECOVERY OR UNTWISTING

Gerald Johannes Munzner, Leipzig, Germany, assignor to VEB Vereinigte Baumwollspinnerein und Zwirnerein, Baumwollspinnerei Foha, Foha, Germany

Filed July 6, 1971, Ser. No. 159,820
Int. Cl. D01h *7/90*; D02g *1/16*
U.S. Cl. 57—157 TS 10 Claims

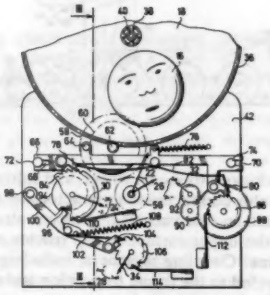


Process for making textured threads which are not subject to twist recovery or untwisting, from synthetic fiber materials consisting of capillary fibers, with a view to obtaining the characteristics of native vegetable threads, comprising the steps of continuously feeding the fiber materials, e.g., from a double-wire spindle, through a feed zone where preferably tension is regulated, heating the materials so as to fix the twist applied thereto, successively cooling the materials, thereby strengthening their intermolecular structure, and subjecting the same to texturing, followed by optional winding up of the completed single or mixed textured threads.

3,721,083
CALENDAR CLOCK

Heinz Jauch, 773 Villigen-Schwenningen, Germany, assignor to Erhard Jauch Uhrenfabrik, Stadtbezirk, Schwenningen, Germany

Filed Feb. 17, 1972, Ser. No. 227,118
Claims priority, application Germany, Feb. 18, 1971, P 21 07 829.5
Int. Cl. G04b *19/26*
U.S. Cl. 58—3 10 Claims



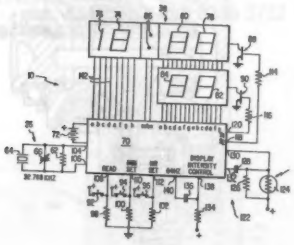
A calendar clock comprising a conventional clockwork mechanism for indication of the time of day and a calendar mechanism coupled to the clockwork mechanism for being driven thereby by means of a 12-hour wheel which is seated on the hour-wheel shaft and which meshes in a ratio of 1:2 with a 24-hour wheel supported in the body of the calendar mechanism. The calendar mechanism is adapted to indicate the day of the week, the date, the month and moon phases, and it includes separate indicating devices therefor which are actuated by the clockwork mechanism. The day, date and month indicating devices are provided with respective dials each with indicia in the clockwise direction, and a respective

hand. The hands are driven by means of ratchet wheels which derive their movement from the clockwork mechanism by means of pawls and an operating mechanism which follows curved cams and actuates the pawls.

3,721,084
SOLID STATE WATCH INCORPORATING LARGE-SCALE INTEGRATED CIRCUITS

Bruno M. Dargent, Lancaster, Pa., assignor to Hamilton Watch Company, Lancaster, Pa.

Division of Ser. No. 138,547, April 29, 1971. This application Aug. 3, 1971, Ser. No. 168,643
Int. Cl. G04b *19/30*
U.S. Cl. 58—50 R **14 Claims**



Disclosed is a solid state wristwatch having no moving parts. A crystal oscillator supplies a timing signal through a binary divider and display actuator to an electro-optical display in the form of a digital array of light-emitting diodes. The vast majority of the electrical components of the watch are incorporated in one or more large-scale integrated circuits.

3,721,085
CALENDAR DRIVING MECHANISM FOR DATE AND WEEK DAY INDICATING TIMEPIECE

Roland Zaugg, Grenchen, Switzerland, assignor to A. Schild S.A., Grenchen (Canton of Soleure), Switzerland

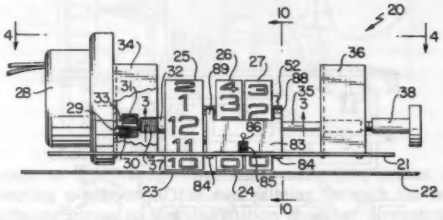
Filed Aug. 17, 1971, Ser. No. 172,438
Claims priority, application Switzerland, Aug. 19, 1970, 12401/70
Int. Cl. G04b *19/24*
U.S. Cl. 58—58 **5 Claims**

A driving wheel making one revolution in 24 hours automatically indexes the date indicator and the week day indicator at midnight by means of a date indexing member and a week day indexing member. At a predetermined point of its revolution the driving wheel produces the engagement of a detent mechanism that afterwards progressively bends the two indexing members. At a further predetermined point of its revolution the driving wheel produces releasing of the detent mechanism so that the indexing members become free simultaneously and index the two indicators in unison.

3,721,086
DIGITAL CLOCK AND METHOD OF OPERATION AND MAKING THE SAME

Paul T. Flumm, Oakville, Conn., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Feb. 8, 1971, Ser. No. 113,368
Int. Cl. G04b *19/02*
U.S. Cl. 58—125 C **35 Claims**

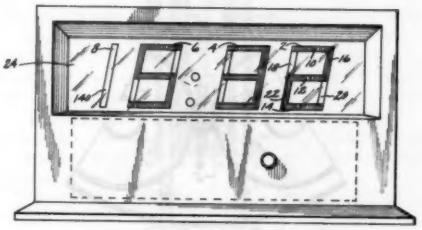


A digital clock construction having a frame carrying a rotatable shaft driven by a timer at a predetermined rate. A plurality of time indicating wheels are rotatably mounted on the shaft. A first drive structure is carried by the shaft and is operatively associated with one of the wheels for incrementally rotating the one wheels relative to the shaft on a time basis as the shaft rotates. Other drive structure is operatively associated with the shaft and the remaining wheels to tend to rotate the remaining wheels as the shaft rotates. Latch structure is operatively associated with the one wheels and the remaining wheels for holding the remaining wheels from rotating relative to the frame except in a timed relation to the incremental movement of the one wheels relative to the frame.

3,721,087
DIGITAL CLOCK

Robert L. Boyles, Wayland, and Samuel Polonsky, Medway, both of Mass., assignors to General Electric Company, Bridgeport, Conn.

Filed Nov. 8, 1971, Ser. No. 196,479
Int. Cl. G04b *19/00, 19/02*
U.S. Cl. 58—126 E **10 Claims**



A digital clock wherein four numerals corresponding to minutes, tens of minutes, hours and tens of hours are simultaneously displayed. Three rotatable cams are provided for successively indexing the minutes, tens of minutes and hours display indicators, and the cam for the hours display indicator also actuates the tens of hours display indicator. A unique indexing mechanism is positioned between the minutes cam and the tens of minutes cam for indexing the minutes cam one in-

crement each minute and for simultaneously indexing the tens cam one increment at the instant of the tenth actuating increment of the minutes cam.

3,721,088

FUEL CONTROL SYSTEM FOR GAS TURBINE ENGINES

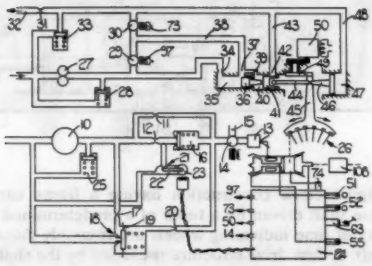
Geoffrey Arthur Lewis, Olton, Solihull, Warwichshire, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed April 21, 1971, Ser. No. 136,273

Claims priority, application Great Britain, April 25, 1970, 19,989/70

Int. Cl. F02c *9/04*

U.S. Cl. 60—39.28 R 14 Claims



A fuel control system for a gas turbine engine supplied with fuel by a positive displacement pump has a flow control arrangement, a first spill valve connected across the pump and responsive to electrical signals dependent on engine operating conditions, and a second spill valve connected across the pump and responsive to the pressure drop across the flow control arrangement.

3,721,089

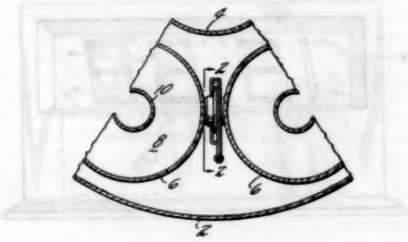
CROSSOVER TUBE CONSTRUCTION

Abraham Morrison, Windsor, and Frederick C. Hetzer, Windsor, both of Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed June 8, 1971, Ser. No. 151,019

Int. Cl. F02c *7/20*; F16l *37/08*

U.S. Cl. 60—39.32 2 Claims



A crossover tube construction includes a crossover tube on one flame tube with a flange on the outer end thereof cooperating with a flanged ring loosely mounted on the cooperating crossover tube on the adjacent flame tube with a ring overlying said flanges to hold them closely adjacent and permit relative transverse movement between adjacent flame tubes.

3,721,090

HYDRODYMANIC TORQUE CONVERTERS

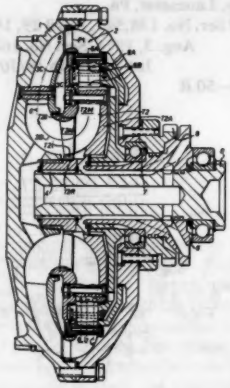
Karl Gustav Ahlen, Stockholm, Sweden, assignor to S.R.M. Hydromekanik AB, Stockholm-Vallingby, Sweden

Filed Aug. 4, 1971, Ser. No. 168,826

Claims priority, application Great Britain, March 5, 1971, 6153/71

Int. Cl. F16d *33/00*; F16h *41/00*

U.S. Cl. 60—362 22 Claims



A hydrodymanic torque converter comprising a toroidal working chamber having a fluid outflow region, a fluid inflow region, and inner and outer transition regions. A ring of pump blades are located essentially in the outflow region, and a ring of guide blades and rings of turbine blades are located generally in the inflow region. At least a portion of one of the blade rings is positioned in one of the transition regions and includes blades which are twisted three-dimensionally by differing amounts along their lengths while the blades of the remaining rings are essentially two-dimensional in that they are of the same twist angle along their lengths.

3,721,,6 1

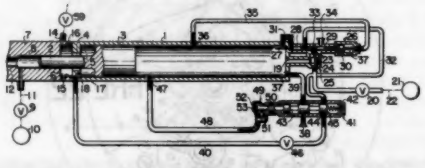
IMPACT HYDRAULIC FORMING DEVICE

Hiroshi Tominaga, and Masanobu Takamatsu, both of Yokohama, Japan, assignors to Tokyu Sharyo Seizo Kabushiki Kaisha, Tokyo, Japan

Filed April 23, 1971, Ser. No. 136,685

Int. Cl. F15b *7/00*

U.S. Cl. 60—54.5 H 7 Claims



An impact hydraulic forming device has a hydraulic pressure chamber with a bore filled with water, and a plunger is arranged to be thrust into the bore by a hammer which is unitary with the plunger and which is reciprocable in a cylinder. Means are provided to direct a jet of water across the open end of the bore in such a way as to seal the water in the bore from flowing out of the bore, to provide a water membrance. The face of the hammer joined to the plunger has an annular recess of curvilinear cross section whose surface merges smoothly with the exterior surface of the plunger, and air jet means are arranged to be directed against this annular groove

to retract the hammer. The hammer is advanced under air pressure for a pair of its stroke after which the pressure air is shut off and the advance of the hammer is carried out by expansion of the air in the cylinder. The air jets directed against the recessed end face of the hammer are also shut off after the hammer has completed part of its return stroke, with the return stroke being completed due to the expansion of the air jetted into the cylinder. Valve means control reciprocation of the hammer, and the valve means may be flow pressure operated valves of may be solenoid valve controlled by an electrical control device.

3,721,092

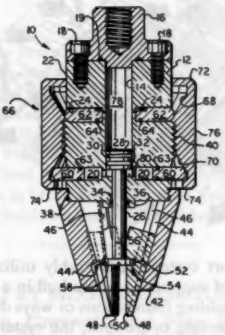
CHUCK

Thomas W. Schafer, Chula Vista, Calif., assignor to Rohr Corporation, Chula Vista, Calif.

Original application Feb. 13, 1970, Ser. No. 11,090. Divided and this application Aug. 12, 1971, Ser. No. 171,347

Int. Cl. F15b 7/00; B23b 5/22

U.S. Cl. 60—54.5 H **2 Claims**



Chuck includes cylindrical housing with central bore and two sets of holes extending from the bore to side surface of housing, said sets being spaced apart axially of the housing and the holes in each set being spaced apart circumferentially thereof. Actuating pistons are disposed in said holes and project from side surface of housing, and a drive piston is disposed in bore between two sets of holes. A collar is mounted on housing for movement axially thereof and has on its inner side cam surfaces which slope relative to side surface of housing and respectively engage projecting ends of actuating pistons in two sets of holes. Fluid disposed in bore between actuating pistons and drive piston cause latter to move axially of bore when collar moves axially of housing and thereby forces one set of actuating piston toward bore while permitting other set of actuating pistons to move away from bore. A collet having jaws therein is attached to housing, and shaft connected to drive piston varies spacing between jaws when drive piston moves in bore.

3,721,093

REACTION PROPULSION ENGINE WITH VAPORIZED FUEL DRIVEN TURBINE

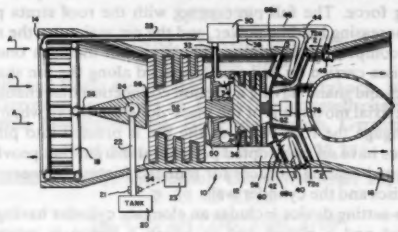
Robert L. Wolf, Chesterfield County, Va., and Rodney McGann, Northridge, Calif., assignors to Texaco Inc., New York, N.Y.

Filed Nov. 20, 1963, Ser. No. 324,932

Int. Cl. F02k 11/00

U.S. Cl. 60—267 **1 Claim**

1. A reaction propulsion system including means providing a combustion chamber having at its rearward end an impulse expansion outlet nozzle, means providing a ram air intake, means directing air from the ram air intake to the forward end of the combustion chamber, a fuel storage chamber, indirect heat exchange means in heat exchange contact with the ram air in said air directing means, means directing fuel from said storage chamber through said heat exchange means, an air compressor providing a portion of the air directing means between the heat exchange means and the forward end of the combustion chamber, a direct expansion turbine for driving said compressor, a regenerative heat exchanger in said combustion chamber, means for selectively directing at least a portion of the fuel passing through said heat exchange



means to said regenerative heat exchanger, means for directing a portion of the fuel passing through the heat exchange means to the combustion chamber downstream of the regenerative heat exchanger, means for directing the other portion of the fuel from said heat exchange means and the fuel passing through the regenerative heat exchanger through the direct expansion turbine, and means for directing the fuel exhausting from the turbine into the combustion chamber selectively up and downstream of the regenerative heat exchanger.

3,721,094

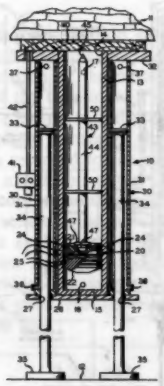
APPARATUS FOR AND METHOD OF SETTING PINS IN MINE ROOFS

Gerald W. Elders, Christopher, Ill.; Thomas E. Schneider. and John R. Alongi, both of Du Quion, all of Ill., assignors to Pin-Set Corporation, Christopher, Ill.

Continuation of Ser. No. 846,795, Aug. 1, 1969, abandoned. This application Nov. 26, 1971, Ser. No. 202,097

Int. Cl. E21d 21/00

U.S. Cl. 61—45 B **14 Claims**



A method of installing a pin in a mine roof in which an elongate pin is pressed into the mine roof by a substantially smooth pushing force applied to the pin head, and the mine roof is subjected to a compressive pressure in the area of the pin to force the roof strata tightly together so that the pin will hold the strata in such condition. The compressive pressure applied to the roof is applied before and during the pressing of the pin

into the roof and/or applied to the roof through the pin at the time the pin is pressed into the roof. More particularly, the method comprises the steps of disposing the pin in an open-end cylinder with the pin head engaging an internal piston, disposing a block between the mine roof and the open-end of the cylinder, and holding the cylinder against the block and holding the block against the mine roof at the area at which the pin is to be fixed. A compressive pressure is applied to the mine roof through the block by jacks so that the roof strata is forced tightly together and thereby preconditioned. Fluid pressure is applied to the piston and the pin is pressed through the block and into the mine roof under a substantially smooth pushing force. The full pin contact with the roof strata provides increasing holding power, and the pin maintains the roof in the compressed condition. The roof pin includes one or more discs carried by and axially spaced along the pin shank, the discs and shank having a friction connection that enables a slidable axial movement of the discs along the shank when the discs engage the roof block as the pin is pressed into place. The discs have an interrupted peripheral margin that provides interrupted bearing surfaces for reduced friction between the guide discs and the cylinder wall.

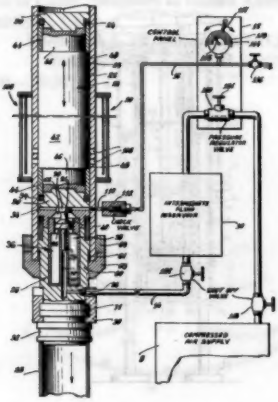
A pin-setting device includes an elongate cylinder having an open-end and a closed end in which a piston is movably mounted, the pin being located in the cylinder with the pin head seating on the piston. A pair of fluid jacks are located on opposite sides of and attached to the pin cylinder. A pressure plate is carried by the pin cylinder substantially near the open-end, the pressure plate overlapping the jacks and engaging the mine roof to locate the open cylinder end in the predetermined area at which the pin is to be fixed, and holding the block against the mine roof. The jacks exert pressure on the mine roof through the pressure plate and block, and clamp the open-end of the pin cylinder in such position. Upon introduction of fluid into the cylinder, the piston is moved in a direction to press the pin into the mine roof under a substantially smooth pushing force.

3,721,095

CONTROLLABLE FORCE METHOD AND SYSTEM OF DRIVING PILES

Stephen V. Chelminski, West Redding, Conn., assignor to Bolt Associates, Inc., Norwalk, Conn.

Filed Aug. 23, 1971, Ser. No. 173,917
Int. Cl. E02d 7/02
U.S. Cl. 61—53.5 **21 Claims**



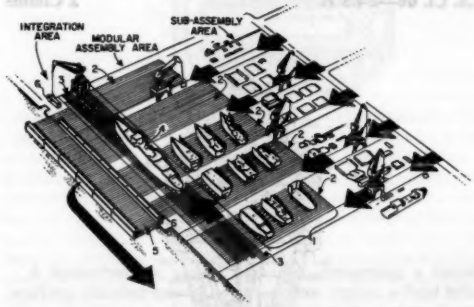
A method and system for determining the magnitude of a driving force being exerted on a substantially rigid object being driven into the earth, such as a pile, and controlling the magnitude in response to that determination. Where the pile driver utilizes a massive piston weight reciprocating in a cylinder and bouncing upon pressurized fluid in a chamber, the force magnitude is determinable by sensing pressure values occurring in the bounce chamber. Force control is obtainable by regulating the flow of pressurized fluid into the bounce chamber in response to the determination. Peak pressure values are sensed by pressure gauge or transducer means to determine the peak values of driving force being exerted on the top of the pile and control of the pile driver operation can be manually or automatically obtained.

3,721,096

SOFT SUPPORT SYSTEM FOR HULLS AND THE LIKE

Albert V. Deckert, Jr., New Orleans, and Frederick J. Brinkmann, Metairie, both of La., assignors to Associated Ideas International, Inc., New Orleans, La.

Filed Aug. 26, 1970, Ser. No. 66,985
Int. Cl. B63c 5/04; F16f 15/16
U.S. Cl. 61—66 **5 Claims**



A "soft" support system, preferrably utilizing pneumatic bellows, capable of supporting a ship hull in a relatively level condition on its building foundations or ways during construction and during moving operations; the system uses either a dynamic or a static "soft" support insert between the basic "hard" foundation supports and the vessel shell; in addition to the preferred pneumatic bellows the "soft" support insert could be inter alia a hydraulic, steel or rubber/elastomeric "spring"; the system in its dynamic mode is capable of raising, lowering or leveling the ship hull, or in minutely positioning hull sections to be joined together during construction operations; the system effectively distributes all loads and reactions between the hull and the foundation or ways thereby tending to eliminate unequal elevations of the foundation or way support locations and tending to nullify hull movement effects due to welding stresses and/or temperature changes, thereby tending to provide a constant support system; during moving operations across the foundations or ways, the constant support system will more nearly allow the horizontal pushing force requirements at each support location to equalize; the preferred embodiment of the "soft" support element includes a series of pneumatic bellows units, each unit including a set of three rubber bellows fastened between two opposing plates, the pneumatic pressure in the bellows being variable, system control for the pneumatic pressure can be a simple manual operation or can be highly sophisticated.

3,721,097

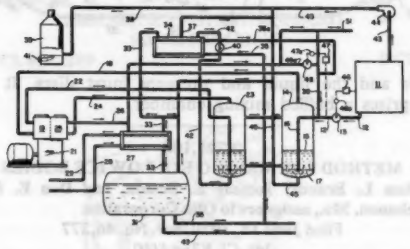
AMMONIA EFFLUENT RECOVERY AND LIQUEFACTION FROM TEXTILE TREATING ZONE

George C. Briley; James J. Shepherd, and Thomas A. Lyons, all of Houston, Tex., assignors to Cluett Peabody & Co., Inc., New York, N.Y.

Filed Nov. 16, 1970, Ser. No. 89,927
Int. Cl. F25j 1/00, 3/00
U.S. Cl. 62—11 **4 Claims**

Ammonia is recovered and liquefied from a mixture of ammonia and air emitted from an ammonia treatment chamber

used in processing of textiles. The processing of textiles is regarded herein as the "prime" system. In the recovery system, subordinated to the prime system, cooling and compression are followed by condensing then purging. Noncondensibles are oxidized in an furnace and liquid ammonia is returned for reuse to the treatment chamber of the prime system. Controlling delivery of the mixture from the treatment chamber based on pressure therein accommodates maintainance of a



minimal negative pressure in the treatment chamber. The furnace is used also to dispose of the ammonia and air mixture during startup and shutdown of the prime system. The furnace also may be used to oxidize ammonia from the treatment chamber so that the treatment chamber can function in its normal manner even in the event the recovery system is out of service. When feed to the recovery system is interrupted, a recycled stream is brought into play to load falsely the compressor so that shutdown thereof is avoided.

3,721,098

COOLING BY MIXING GASEOUS STREAMS

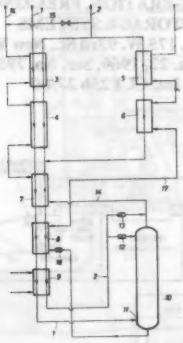
Wolfgang Forg, Grunwald, and Peter Dupont, Munich, Germany, assignors to Linde Aktiengesellschaft Zentrale Patentabteilung, Hollriegelskreuth, Germany

Filed Dec. 18, 1969, Ser. No. 886,246

Claims priority, application Germany, Dec. 18, 1968, P 18 15 532.3

Int. Cl. F25j *1/00, 3/03, 3/06*

U.S. Cl. 62—17 **8 Claims**



In a process for the production of ammonia synthesis gas comprising the steps of cooling nitrogen and raw hydrogen in heat exchange with scrubbing column products; scrubbing the raw hydrogen in a column countercurrently to liquid nitrogen; and admixing cooled nitrogen to purified hydrogen gas leaving the column, in an amount required to establish a hydrogen:nitrogen ratio of 3:1; the improvement comprising compressing said nitrogen, prior to said cooling, to a higher pressure not substantially above 10% of the pressure of resultant scrubbed hydrogen gas, said higher pressure being sufficient to admix resultant cooled nitrogen to said scrubbed hydrogen. In addition, because lower pressures can be utilized for obtaining the necessary make-up refrigeration, the same turbocompressor employed for compressing nitrogen cycle gas is employed for compressing the nitrogen to be fed to the scrubbing column.

3,721,099

FRACTIONAL CONDENSATION OF NATURAL GAS

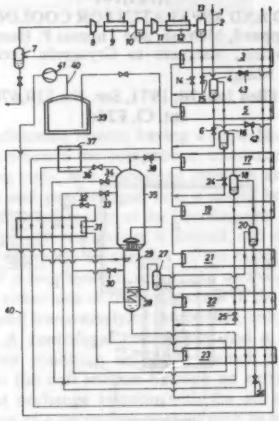
Wolfgang Forg, Grunwald, and Volker Etzbach, Munich, Germany, assignors to Linde Aktiengesellschaft, Zentrale Patentabteilung, Hollriegelskreuth, Germany

Filed Mar. 24, 1970, Ser. No. 22,233

Claims priority, application Germany, Mar. 25, 1969, P 19 15 218.2

Int. Cl. F25j *1/00, 3/00, 3/06*

U.S. Cl. 62—29 **10 Claims**



A system for the liquefaction of natural gas wherein nitrogen is removed from the gas by rectification, involves fractional condensation of the natural gas and passing a gaseous portion of the thus-treated gas through the sump of a rectification column, in indirect heat exchange with sump liquid. At least a portion of the resultant condensed gaseous portion is returned to the rectification column as feed through an expansion valve. Heat exchangers are employed to subcool natural gas liquid passing to the storage tank and reflux liquid passing to the rectification column, said heat exchangers being cooled by nitrogen fractions withdrawn from the rectification column. The overall system provides for savings in refrigeration energy, and also provides peak refrigeration loads for start-up procedures and the like.

3,721,100

COLD TRAP

Robert J. Bovio, Lowell, Mass., assignor to GTE Sylvania Incorporated

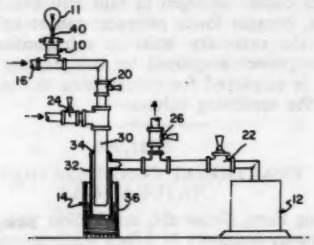
Filed Aug. 5, 1971, Ser. No. 169,479

Int. Cl. B01d *5/00*

U.S. Cl. 62—55.5 **1 Claim**

A method of preventing corrosive gases from entering the vacuum pump of a vacuum and fill system that is used in conjunction with lamp manufacture. In performing the method a

cold trap, which may be a flask of liquid nitrogen is interposed in the line between the vacuum pump and the vessel to be evacuated. During the vacuum and fill operations, unused



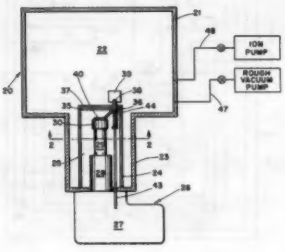
amounts of fill gases such as bromine and iodine normally would be drawn from the lamp into the vacuum pump. When the flask of liquid nitrogen is interposed in the line, however, the gases are collected in the trap.

3,721,101

METHOD AND APPARATUS FOR COOLING A LOAD

John C. Sheppard, Melrose, and Thomas P. Hosmer, Concord, both of Mass., assignors to Cryogenic Technology, Inc., Waltham, Mass.

Filed Jan. 28, 1971, Ser. No. 110,678
Int. Cl. F25d
U.S. Cl. 62—56 **39 Claims**



Method and apparatus for cooling a load such as a sample for spectroscopic analysis, an electronic component or a cryopumping surface. A constant source of cryogenic refrigeration is controllably thermally engaged with the load by externally actuated means. That part of the refrigeration system requiring insulation is contained within an evacuatable chamber while the working zone containing the load is normally contained within another separate evacuatable chamber. These chambers may be in controllable fluid communication.

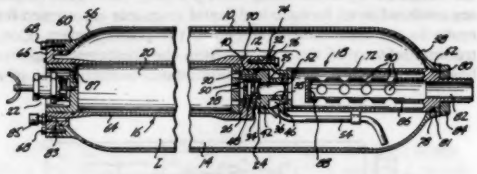
3,721,102

COOL WORKING GAS GENERATOR

Charles J. Green, Vashon Island, Wash., assignor to Rocket Research Corporation, Redmond, Wash.

Filed Dec. 4, 1969, Ser. No. 882,221
The portion of the term of the patent subsequent to Mar. 11, 1986, has been disclaimed
Int. Cl. F17c *11/00*
U.S. Cl. 62—48 **16 Claims**

Hot pressure gases are generated by burning a solid fuel grain. A portion of the gases are used to pressure feed a liquid from its storage chamber into a mixing zone. The remainder of the hot gases are directed into the mixing zone for mixing therein with the liquid. The hot gases provide the heat of vaporization for, and cause the vaporization of, the liquid. The liquid may be liquefied ammonia gas or a liquefied ammonia gas and water mixture. The gas generator includes a removable control insert comprising metering passageways from the hot



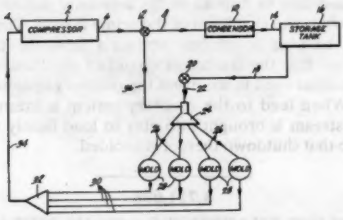
gases and the liquid and pressure burst discs. It also comprises a baffled mixing chamber.

3,721,103

METHOD FOR MAKING HOLLOW ICE BODIES

William L. Brandt; Tommy E. Boston, and Don E. Reed, Lebanon, Mo., assignors to Olin Corporation

Filed June 15, 1970, Ser. No. 46,277
Int. Cl. F25c *1/10*
U.S. Cl. 62—73 **1 Claim**



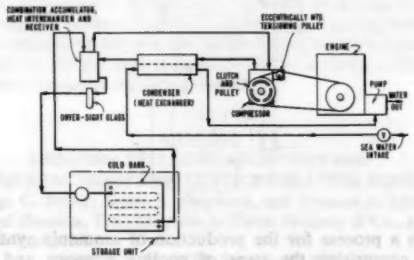
A hollow body of ice is formed by filling with water a mold having a cavity conforming to the desired shape of the body. The mold is then cooled for a time period sufficient to freeze only the peripheral portion of the volume of water filling the mold. The partially frozen body is then removed from the mold and a pair of opposed holes are punched through the ice layer to permit the entrained water to drain out, leaving a thin-walled shell of ice.

3,721,104

MARINE REFRIGERATION, FREEZING AND COOL STORAGE SYSTEMS

Ralph Michael Adler, 175 W. 93rd St., New York, N.Y.

Filed Jan. 22, 1969, Ser. No. 793,028
Int. Cl. F25b *27/00*
U.S. Cl. 62—240 **18 Claims**



A refrigeration, freezing and/or storage system for use on marine vessels having insulated enclosures or cabinets comprises a plurality of components which may be flexibly located depending upon the size and available space in any particular boat or ship, the system comprising a compressor, nonelectri-

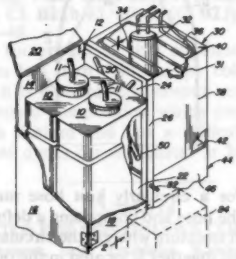
cal means for operating the compressor, a container, a eutectic solution disposed in said container and means for freezing the eutectic solution.

3,721,105

REFRIGERATION, CONDENSATION COLLECTING AND REMOVAL APPARATUS

Owen J. Schwertfeger, Chicago, and Frank Daniel Brill, Norridge, both of Ill., assignors to The Seeburg Corporation, Chicago, Ill.

Filed Aug. 5, 1971, Ser. No. 169,331
Int. Cl. F25d *21/14*
U.S. Cl. 62—289 **9 Claims**



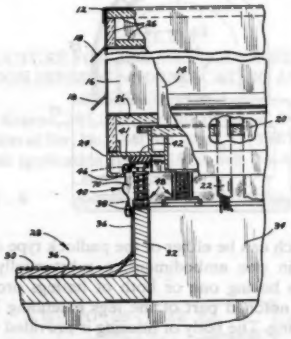
An enclosed compartment is refrigerated by the heat transfer through a refrigerated wall positioned at the upper refrigerated wall is collected in a channel formed along the lower edge of the refrigerated wall. The channel is inclined to permit the condensed moisture to flow down the channel and out of a conduit through the wall of the compartment to a container.

3,721,106

MOUNTING FOR ROOF TOP AIR CONDITIONER

Henry C. Bierwirth, Wayzata, and James V. Foty, Minneapolis, Minn., assignors to Lear Siegler, Inc., Minneapolis, Minn.

Filed Aug. 18, 1971, Ser. No. 172,779
Int. Cl. F25d *19/00*
U.S. Cl. 62—297 **4 Claims**



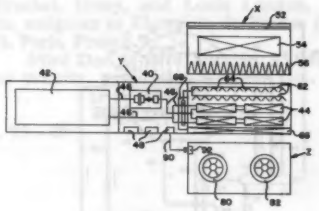
A rectilinear upstanding, continuous, rigid curb on a flat roof top defines an opening through the roof. Vibration isolation means are supported on top of the periphery of this curb and, in turn, support the main frame of a complete air conditioning unit. The vibration isolation means includes a continuous sheet of flexible material in sealing relationship to both the entire lower outer periphery of the air conditioning unit frame and the entire upper outer periphery of the curb, and loosely disposed between the curb and frame. This sheet isolates the inside of the air conditioning unit and building from the outside thereof; and insulates the space within the curb and the unit from the temperature and weather conditions outside.

3,721,107

HIGH CAPACITY PREFABRICATED AIR CONDITIONING SYSTEM

William F. Stockford, and Joseph M. Gamewell, both of Salisbury, N.C., assignors to Gamewell Mechanical, Inc., Salisbury, N.C.

Filed May 14, 1971, Ser. No. 143,319
Int. Cl. F25d *19/00*
U.S. Cl. 62—298 **4 Claims**



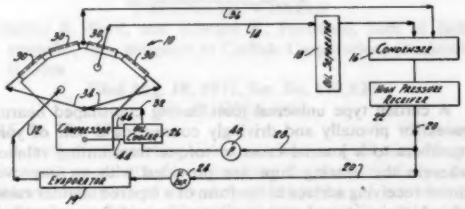
An air conditioning system having a capacity in excess of 100–150 tons wherein the compressor, condenser, expansion means, cooling coils, and associated conduits and wiring are prefabricated and prepackaged into a single housing at the factory, hereafter referred to as the "cooling unit," that can be factory charged with refrigerant, if desired, and shipped to the construction site ready to connect to the building ductwork and electrical power system. Air intake and supply sections are set up on either side of the coil section of the cooling unit, and air is passed transversely of the cooling unit, through the coil section. A centrifugal compressor and a conventional condenser unit condition refrigerant which is directly introduced into the coil section through an expansion means and into heat exchange relation with the air to be cooled, without the use of a secondary coolant such as a water chiller and the insulated pipes and air handlers commonly associated with a system of this size. Such a system is used preferably in conditioning air for one or a few large areas as opposed to a plurality of smaller zones.

3,721,108

REFRIGERANT COOLED COMPRESSOR

Erich J. Kocher, Milwaukee, Wis., assignor to Vilter Manufacturing Corporation, Milwaukee, Wis.

Filed June 15, 1971, Ser. No. 153,230
Int. Cl. F25b *31/00*
U.S. Cl. 62—470 **5 Claims**



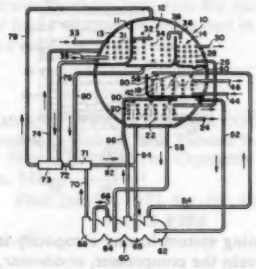
In a refrigerating system including a compressor, condenser, evaporator, and an oil cooler, a refrigerant cooling system for the compressor including a bypass line connected between the

condenser and evaporator, and including a pump for providing high pressure liquid to the oil cooler and to the heads of the compressors, and a return conduit connecting the discharge refrigerant from the compressor cooling system through a desuperheater in the compressor discharge line to the condenser.

3,721,109
HIGH PRESSURE MULTIPLE PUMP FOR ABSORPTION REFRIGERATION MACHINE

James M. Porter, La Crosse, Wis., assignor to The Trane Company, La Crosse, Wis.

Filed June 3, 1971, Ser. No. 149,552
Int. Cl. F25b *15/06*
U.S. Cl. 62—476 1 Claim

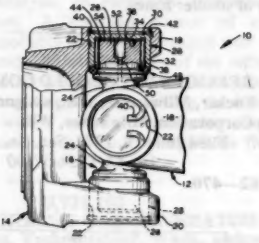


A pump for circulating a plurality of fluids in an absorption refrigeration machine, the pump having a plurality of fluid impellers, at least two of which are arranged in series.

3,721,110
UNIVERSAL JOINT BEARING CUP IMPROVEMENT

Glenn S. Borneman, 605 West Ridge Pike, Royers Ford, Pa.

Filed May 6, 1971, Ser. No. 140,766
Int. Cl. F16d *3/41*
U.S. Cl. 64—17 A 6 Claims

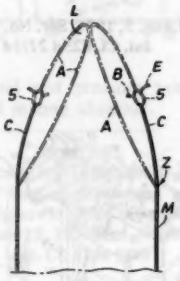


A cardan type universal joint having cup-shaped bearing races for pivotally and drivingly connecting a pair of yoke members to a journal cross in torque transmitting relation wherein the bearing cups are provided with an improved thrust receiving surface in the form of a tapered annular raised rib which is integral with the inner face of the end wall. In another embodiment this feature is combined with a crowned surface on the cylindrical side wall of the bearing race which is designed to permit better distribution of load over the mean span of the trunnion portions of the journal cross.

3,721,111
CLOSED TOE HOSIERY

Giorgio Billi, Firenze, Italy, assignor to G. Billi C. S.p.A., Florence, Italy

Filed April 29, 1969, Ser. No. 820,088
Claims priority, application Italy, May 3, 1968, 4547 A/68
Int. Cl. D04b *9/56*
U.S. Cl. 66—187 5 Claims

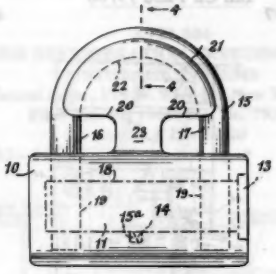


A closed toe for a circularly knit hose made upon the machine making the hose and comprising a deformed two-ply closed tubular welt structure wherein the circular seam joining the plies of the welt together is located in the outer ply of the welt between the ends thereof whereby the seam and the deformation of the welt are located on the sole side of the toe portion of the hose. The method of making the aforesaid closed toe construction by knitting a pair of nested separate tubular sections of fabric of unequal lengths as extension of the tubular foot of the hose and of then joining together the terminal portions of the tubular fabric extensions.

3,721,112
LOCKS

John F. Welkekens, 51 East 42nd St., New York, N.Y.

Filed Aug. 18, 1971, Ser. No. 172,820
Int. Cl. E05b *67/02, 65/08, 65/44*
U.S. Cl. 70—39 6 Claims



A lock which can be either of the padlock type or bolt type comprising, in one embodiment, a substantially U-shaped yoke or hasp having one or both of its legs provided with notches, the notched part of the legs extending into a lock body or housing. The body or housing is provided with a bore or cavity that receives an axially movable cylindrical lock casing containing lock mechanism that is effective, when key-operated, to retract a latch that normally holds the lock casing within the housing. The lock casing extends across the legs of the yoke or hasp and the notches in the legs of the yoke are shaped to conform to the cylindrical curvature of the lock casing so that the engagement between the lock casing and the legs of the yoke is effective to hold the yoke from displacement out of the lock body or housing. When the latch is

retracted, the lock casing can be axially moved to withdraw it from the lock body or housing, thus freeing it from the yoke or hasp which can then be separated from the housing. A saddle or guard may be provided, attached to or separate from the lock housing, to receive the bight portion of the yoke when the yoke is in a locking position. Another embodiment of the invention involves a sliding bolt that is capable of being locked in either an advanced or retracted position by the engagement with a part provided on the cylindrical lock casing.

3,721,113

ROLLING OF LITHIUM

Boghos Karnig Hovsepian, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Aug. 23, 1971, Ser. No. 174,227
Int. Cl. B21b *45/00, 3/00;* B23p *17/04*
U.S. Cl. 72—46 **11 Claims**

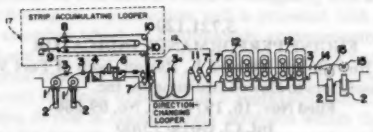
A process for producing thin continuous lithium strips in thicknesses less than 0.40 cm. by cold rolling lithium metal while it is compressed between smooth surfaces of a solid polymeric composition which composition is non-reactive with lithium and has a critical surface tension of not over 46 dynes per centimeter at 20° C.

3,721,114

APPARATUS FOR CONTINUOUS COLD ROLLING

Yasaburo Yazawa, and Yoshiako Kawazoko, Fukuyama, Japan, assignors to Nippon Kokan Kabushiki Kaisha

Filed Feb. 9, 1971, Ser. No. 113,937
Claims priority, application Japan, Feb. 13, 1970, 45/12148
Int. Cl. B21b *41/06*
U.S. Cl. 72—231 **7 Claims**



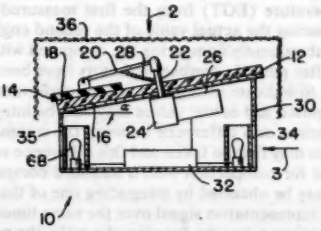
In a continuous cold rolling apparatus, the strip feeding out of the entry facilities is fed to a looper for changing the direction of the strip. The changed - direction strip is then fed to the rolling stands which may be arbitrarily located, such as in parallel or at right angles with the entry facilities.

3,721,115

STRUCTURE FOR AND METHOD OF SURFACE CONDITION SENSING AND INDICATING AND MOTOR SPEED CONTROL

Robert W. Kearns, 20524 Rutherford Avenue, Detroit, Mich.

Continuation of Ser. No. 666,703, Sept. 11, 1967, abandoned. This application June 8, 1970, Ser. No. 48,795
Int. Cl. G01n *19/02*
U.S. Cl. 73—9 **39 Claims**



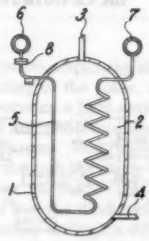
The condition of a surface is sensed by cyclically moving two members having engaged surfaces relative to each other, driving the surfaces for only a portion of each cycle to set up a threshold kinetic energy level in accordance with the friction between the engaged surfaces, sensing the kinetic energy developed in one of the members due to moving the members relative to each other, comparing the developed kinetic energy with the threshold kinetic energy and controlling the cyclic movement of the members in accordance with the relationship between the kinetic energy threshold and the developed kinetic energy. The cyclic movement of the members is then used to provide a visual indication of the condition of one of the surfaces.

3,721,116

METHOD FOR DETECTING STEAM LEAKAGE IN A HEAT EXCHANGER HAVING CIRCULATION TUBES SURROUNDED BY LIQUID SODIUM AND DEVICES FOR THE APPLICATION OF SAID METHOD

Alain Brachet, Orsay, and Louis Lannou, Montesson, France, assignors to Electricite de France (Service National), Paris, France

Filed Dec. 1, 1970, Ser. No. 93,940
Claims priority, application France, Dec. 3, 1969, 6941746
Int. Cl. G01m *3/04*
U.S. Cl. 73—40 **15 Claims**



The leak flow rate, in particular for the determination of a micro-leak, in heat exchangers employed in conjunction with fast nuclear reactors which are cooled by liquid sodium is determined employing known means by locating a given group of tubes including the tube which exhibits leakage among all the tubes of a heat exchanger without modifying the operating conditions of the installation. The tube in the group in which a leak has developed is located. The defective tube is then plugged outside the tank without draining the sodium contained therein and without connecting the steam circulation tubes to the atmosphere.

3,721,117

METHOD AND APPARATUS FOR DETECTING LEAKS IN PNEUMATIC WHEELS

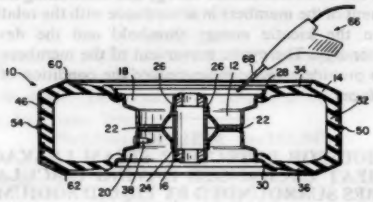
Charles R. Ford, and Edward K. Percifield, both of Indianapolis, Ind., assignors to Carlisle Corporation, Cincinnati, Ohio

Filed Aug. 18, 1971, Ser. No. 172,826
Int. Cl. G01m *3/04*
U.S. Cl. 73—40.7 **7 Claims**

A method of detecting leaks in a wheel assembly including a rim and a pneumatic tire comprising the steps of inflating the tire with a mixture of air and an added probe gas, establishing a chamber enclosing at least the rim and an adjacent annular region of the tire, and then, after a period of time, testing the atmosphere in the chamber for the presence of such a probe gas.

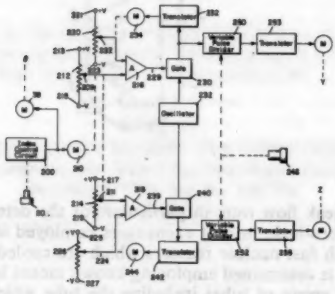
An apparatus for detecting leaks in a pneumatic wheel assembly including a rim and a pneumatic tire mounted on the

rim and inflated with a mixture of air and an added probe gas, the apparatus including impermeable means for circumferentially sealably engaging at least the side wall portions of



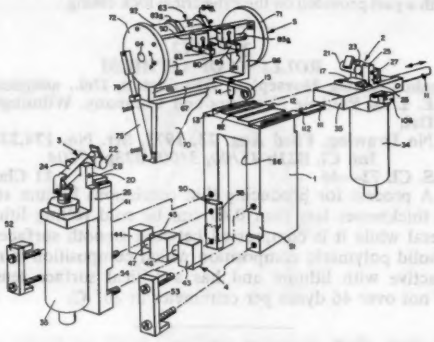
such a tire to define a chamber enclosing such a rim and an adjacent region of such a tire, and a detector for the probe gas arranged to extend into such a chamber.

3,721,118
CURVATURE CONTROL
Nathaniel B. Jeffras, Woodland Hills, Calif., assignor to Automation Industries, Inc., Century City, Calif.
Filed Feb. 22, 1971, Ser. No. 117,417
Int. Cl. G01n *29/04*
U.S. Cl. 73—67.8 **16 Claims**



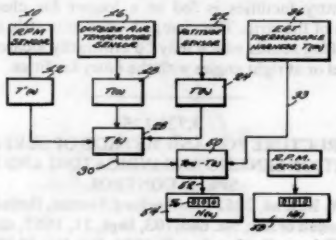
Herein described in an electrical control system for guiding a search unit of a nondestructive material tester over sloped or curved surface shapes and particularly to an index system used on a scanning device. For the slope control, a linear control potentiometer is mechanically geared to one index axis and the linear feedback potentiometer is mechanically geared to the other index axis. An index command initiates an indexing causing the linear control potentiometer to advance. A tangent potentiometer sets the voltage across the linear control potentiometer in proportion to the slope of the angle. The advance of the linear control potentiometer unbalances the inputs to the operational amplifier which gates on the other axis control advancing the linear potentiometer until the inputs are balanced. For curvature control, a sine/cosine potentiometer is null balanced by the linear feedback control potentiometers by stepping motors to provide a closed loop curvature control program. Pulses are also applied to each search unit open loop coordinate axis through dividing circuits to provide reduction of the coordinate axis. Advance of the sine/cosine control during indexing, unbalances inputs to the operational amplifiers which gate on an oscillator. Outputs of each control gate is applied to the feedback motor and to an open loop search unit axis control. The feedback motor advances the feedback linear potentiometer until a null balance condition exists and the gate is turned off.

3,721,119
TENSILE TESTING MACHINE
Robert S. Strimel, Penllyn, Pa., assignor to Tinius Olsen Testing Machine Co. Inc., Willow Grove, Pa.
Filed Sept. 17, 1971, Ser. No. 181,437
Int. Cl. G01n *3/08*
U.S. Cl. 73—95 **18 Claims**



High speed repetitive testing machine for specimens such as paper, etc. The operator slides a specimen on a fixture which properly aligns the same along a test axis. A test button is pressed and the machine automatically carries out the following operation: the specimen is gripped, an extensometer positioned, load is applied, strain is measured directly from the specimen and at rupture the machine returns for another test.

3,721,120
ENGINE PERFORMANCE INDICATOR
John S. Howell, and Richard L. Rowan, both of Fort Worth, Tex., assignors to Howell Instruments, Inc.
Filed Nov. 16, 1970, Ser. No. 89,580
Int. Cl. G01m *15/00*
U.S. Cl. 73—117.3 **8 Claims**



A method and means for measuring changes in the quality of gas turbine engine performance, efficiency or engine trim by measuring at least a first engine parameter such as RPM, computing a second engine parameter value such as exhaust gas temperature (EGT) from the first measured parameter, also measuring the actual value of the second engine parameter and subsequently comparing the computed with the actual values (after possible correction factors have been taken into account) to indicate changes in engine performance or trim. The computed and actual values may also be integrated prior to comparison or a difference between the computed and actual values may first be taken and this difference subsequently integrated for comparison with a standard comparison value such as may be obtained by integrating one of the parameters or a time representative signal over the same timed interval. If the comparison takes the forming of a ratio, the periods of integration may be chosen to insure that the denominator is an

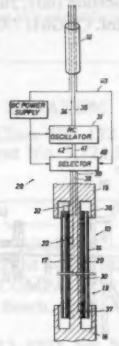
even power of ten such that the integral representing the numerator may be directly interpreted as a performance index.

3,721,121

METHODS AND APPARATUS FOR INVESTIGATING MULTIPHASIC WELL FLUIDS

Claude Fierfort, Lozere, France, assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Nov. 15, 1971, Ser. No. 198,848
Claims priority, application France, Nov. 20, 1970, 7041689
Int. Cl. E21b *47/00*
U.S. Cl. 73—155 23 Claims



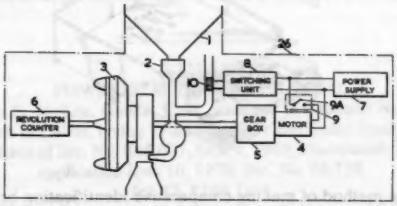
In the new and improved methods and apparatus disclosed herein for determining the volumetric proportions of the different phases of well fluids, a fluid-investigating tool adapted for positioning in a production well is provided with an enclosed chamber which is continuously communicated with multiphasic well fluids exterior of the tool by upper and lower fluid siphon passages which isolate the chamber to allow fluids of different densities to remain in a segregated condition. A measuring device is cooperatively arranged within the fluid chamber for detecting the interface of segregated production fluids within the chamber to provide indications at the surface which are representative of the phase mixture or volumetric composition of the well fluids at the depth of investigation. Unique techniques and apparatus are also provided for calibrating the sampling tool from the surface to assure continued accurate measurements.

3,721,122

AUTOMATIC RECORDING RAIN GAUGE

Colin Frank Lucas, Yateley, Camberley, England, assignor to National Research Development Corporation, London, England

Filed Nov. 30, 1970, Ser. No. 93,716
Claims priority, application Great Britain, Dec. 1, 1969, 58,502/69
Int. Cl. G01w *1/14*
U.S. Cl. 73—171 8 Claims



According to the present invention a rain gauge comprises a container for collecting rain, a pump operative to pump rain water from the container, an electrical sensor responsive to the level of rain water in the container and operative to make and break the supply of power to the pump and means responsive to the drive motion of the pump for affording a measure of rain water collected in and pumped from the container.

In order that the amount of rain water pumped, during each revolution of the pump, is repeatable to a very high accuracy a peristaltic pump may be used.

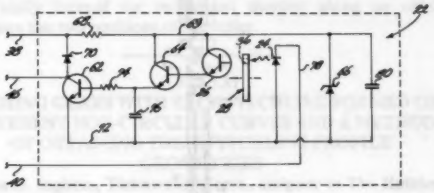
Indicator means, for example a revolution counter or an electronic counter, may be provided to record the drive motion of the pump.

3,721,123

GAS-FLOW MONITORING SYSTEM

Joseph Heim, 728 N.E. Floral Place, Portland, Oreg.

Filed Feb. 17, 1972, Ser. No. 227,104
Int. Cl. G01f *1/00*
U.S. Cl. 73—194 E 14 Claims



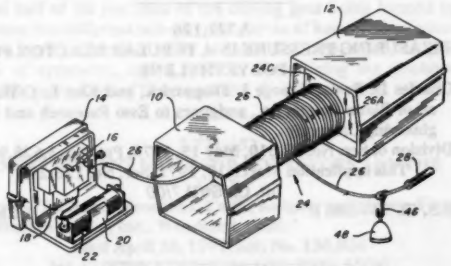
A gas-flow monitoring system employing an apertured rotor whose apertures, with turning of the rotor, alternately block and pass a beam of light between a light-emitting diode and a phototransistor. The diode and phototransistor are connected in a circuit wherein current that flows through the phototransistor also flows through the diode to change the intensity of light emitted from the diode. This circuit produces an output signal each time that the diode and phototransistor communicate with one another through a different successive aperture in the rotor.

3,721,124

DEVICE FOR INDICATING THE TEMPERATURE AND DEPTH OF WATER

Buryl A. Franks, Tulsa, Okla., assignor to Lowrance Electronics, Inc., Tulsa, Okla.

Filed Dec. 10, 1970, Ser. No. 96,785
Int. Cl. G01k *1/14*
U.S. Cl. 73—344 3 Claims



A device for indicating the temperature and depth of water, including a housing having a temperature indicating meter in one end, a spool extending from the other end of the housing having a cable wound thereon, one end of the cable being connected to the meter, a temperature sensing probe connected to the other end of the cable, the cable having depth markings at spaced intervals thereon, and a cover affixed to said spool and slidable between closed and opened positions, in the

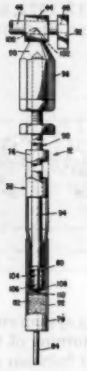
opened position the cover being spaced away from the housing and exposing the spool whereby the cable may be wound onto and off the spool and in the closed position the cover contacting the housing and encompassing the spool.

3,721,125

THERMAL ACTUATOR FOR A METER TEMPERATURE COMPENSATING MECHANISM

Carl J. Kugler, Philadelphia, and Norman Porter, Sellersville, both of Pa., assignors to The Singer Company, New York, N.Y.

Filed June 23, 1971, Ser. No. 155,952
Int. Cl. G01k 5/32; G01f 3/20
U.S. Cl. 73—368.3 5 Claims



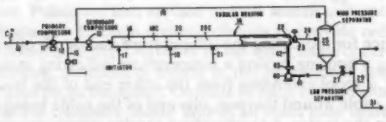
A thermal actuator for a meter temperature compensating mechanism which includes a casing mounted in the meter housing within a temperature well so as to be exposed to the mainstream of throughput flow of the meter. The casing has a hermetically sealed chamber at its lower end filled with a thermally expansible liquid. A bellows enclosed the top of the chamber and extends downwardly therein. An actuator rod is mounted between the bellows and a temperature compensating mechanism in a friction-free manner by the opposite ends thereof, making point contact respectively with the bellows and said mechanism. The thermal actuator signals changes in the density of the throughput flow of the meter caused by variations in the fluid temperature. The actuator rod will move friction-free upwardly or downwardly in direct proportion to the temperature change, to thus cause a corresponding shift in said mechanism to compensate for the changing volume in the throughput flow.

3,721,126

MEASURING PRESSURE IN A TUBULAR REACTOR FOR POLYETHYLENE

Charles D. Beals; George I. Fitzpatrick, and Kim L. O'Hara, all of Baton Rouge, La., assignors to Esso Research and Engineering Company

Division of Ser. No. 37,610, May 15, 1970, Pat. No. 3,628,918. This application March 19, 1971, Ser. No. 126,299
Int. Cl. G01l 7/00
U.S. Cl. 73—388 R 1 Claim



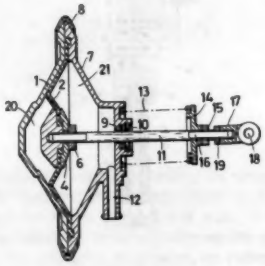
The pressure in a tubular reactor for producing polyethylene under high pressure is measured by pumping an inert or compatible liquid with a positive displacement pump into a line connected to the reactor and maintaining said pumping at small flow rates so that some flow occurs at all times and measuring the pressure head which said pump is pumping.

3,721,127

DIAPHRAGM DEVICE, SENSITIVE TO ABSOLUTE PRESSURES

Giampaolo Garcea, 18 Milan, Italy, assignor to Alfa Romeo S.p.A., Milan, Italy

Filed May 13, 1971, Ser. No. 143,003
Claims priority, application Italy, June 19, 1970, 26302A/70
Int. Cl. G01l 7/08
U.S. Cl. 73—406 3 Claims



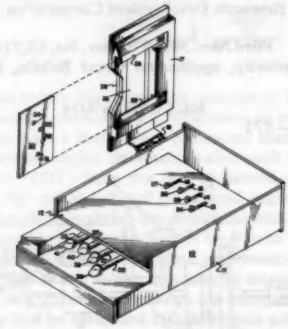
Device for measuring absolute pressures, of the pliable diaphragm type which cooperates with a capsule having rigid walls and containing the diaphragm. In the initial assembly stage, the diaphragm completely mates with the surface of either rigid wall of the capsule, so that virtually no air is sealed therebetween. On completion of the assembly, a preload is imparted to the diaphragm by means of an externally mounted spring, so that a vacuum is created between the diaphragm and the rigid wall confronting the diaphragm with the device being adapted not only to measure absolute pressures, but also to control servo devices in response thereto.

3,721,128

CREDIT AND PASS CARD IDENTIFICATION DEVICE

R. E. Thurman, 2216 Cascade Way, Longview, Wash.

Filed Dec. 28, 1970, Ser. No. 101,895
Int. Cl. A61b 5/10
U.S. Cl. 73—432 R 4 Claims



The method of making comparative identification between the holder of identification means and a selected person of this invention includes the steps of recording a multiplicity of indicia upon a carrying media wherein each of the indicia are

coincident with respective terminal ends of fingers extended of a hand of a preselected human being; placing the media into a holding apparatus; placing the extended fingers of a hand extended of the preselected human being in the holding apparatus, aligning the extended fingers of the preselected human being with respective indicia on the carrying media. The apparatus of this invention includes identification carrying media such as a card having prerecorded indicia thereon, each of the indicia on the media being coincident with the terminal ends of respective fingers of a hand extended of a preselected human being, a housing having means operable to engage and to hold the identification carrying media and means in the housing operable to align the terminal ends of fingers extended of a hand of the preselected human being with respective indicia on the identification carrying media.

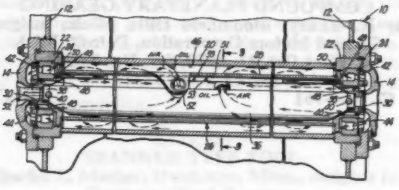
ERRATUM

For Class 73—152 see:
Patent No. 3,721,960

3,721,129
ECCENTRIC SYSTEM FOR VIBRATORY EARTH COMPACTOR

Paul C. Wallick, Long Beach, Calif., assignor to A-T-O Inc., Willoughby, Ohio

Filed Aug. 13, 1971, Ser. No. 171,567
Int. Cl. B06b *1/16*
U.S. Cl. 74—87 **10 Claims**



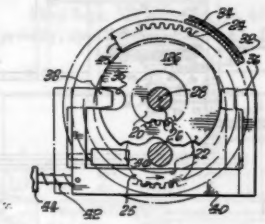
An eccentric system for a vibratory apparatus, such as an earth compactor, comprising a tube having end closures, bearings respectively supporting the end closures for rotation of the end closures and the tube about the axis of the tube, and an eccentric bar within and extending longitudinally of and spaced radially inwardly from the tube, the eccentric bar having ends coaxial with the tube and respectively carried by the end closures of the tube. The tube, its end closures and the eccentric bar constitute an eccentric shaft which, together with its bearings, is enclosed by an outer housing. Impellers at the ends of and rotatable with the eccentric shaft circulate a lubricant, such as oil, between the interior of the tube and the outer housing by way of the bearings, thereby lubricating and cooling the bearings continuously. Air in the structure is also circulated through the bearings by the impellers for cooling purposes.

3,721,130
POWERED ROLLER MECHANISM

James E. McKee, Goleta, Calif., assignor to Republic National Bank of Dallas, Irving Trust Company and Union Bank

Division of Ser. No. 865,071, Oct. 9, 1969, abandoned. This application Dec. 10, 1970, Ser. No. 96,718
Int. Cl. F16h *1/44*
U.S. Cl. 74—86 **19 Claims**

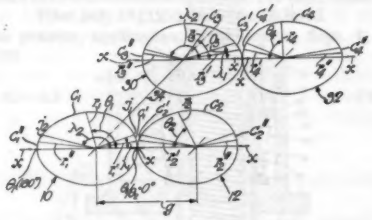
A powered roller movable laterally of its axis between a retracted position and an advanced position is unitary with the ring gear of an eccentric planetary gear set having a sun gear input. The ring gear is journalled on the planet gear carrier eccentrically thereof for movement thereby along an orbit between the two positions of the roller.



3,721,131
MESHING GEARS WITH EACH PITCHLINE FORMED OF DIFFERENT NON-CIRCULAR CURVES AND A METHOD OF OBTAINING THEIR PITCHLINE PROFILE GEOMETRIES

James D. Ingham, Thomaston, Conn., assignor to The Hallden Machine Company, Thomaston, Conn.

Filed Feb. 24, 1971, Ser. No. 118,298
Int. Cl. F16h *35/02*
U.S. Cl. 74—393 **30 Claims**



A pair of driving and driven gears of one-to-one gear ratio, with each gear having an axis of symmetry, and each symmetrical half of the pitchline of the driving gear being formed by at least two different non-circular curves of known polar equations having a junction point at a selected angle from the gear axis of symmetry, and a method of obtaining the pitchline profile geometries of these gears for their production.

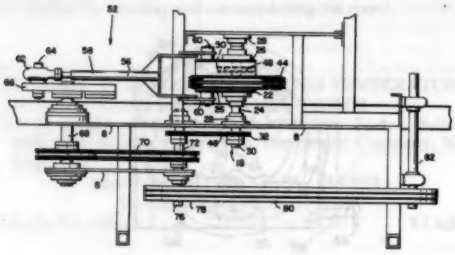
3,721,132
INTERMITTENT DRIVE FOR CONVEYORS AND THE LIKE

Roy W. Johnson, Woodland, Calif., assignor to Johnson Farm Machinery Co., Inc., Woodland, Calif.

Filed April 28, 1971, Ser. No. 138,024
Int. Cl. F16h *35/02*; F16g *1/28*; F16h *55/30*
U.S. Cl. 74—394 **13 Claims**

An intermittent drive for periodically varying the speed and, if desired, the direction of a driven member comprising a driven shaft and a drive shaft coupled via a belt, a chain or the like. The driven shaft is stationary while the drive shaft is mounted to a pivoting frame. A wheel disposed between the shafts and concentric with the pivot axis of the frame spreads apart the belt strands between the shafts and maintains the

belts taut while the frame and the drive shaft pivot. The longitudinal speed of the belt is thus altered, and can be reversed,



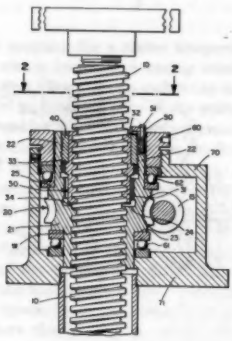
during each complete pivot cycle of the frame and the drive shaft to correspondingly vary the speed and the rate of rotation of the driven shaft.

3,721,133

ANTI-BACKLASH SCREW JACK

Walter J. Denkowski, King of Prussia, Pa., assignor to Philadelphia Gear Corporation, King of Prussia, Pa.

Filed Oct. 7, 1971, Ser. No. 187,325
Int. Cl. F16h *55/18*
U.S. Cl. 74—441 **4 Claims**



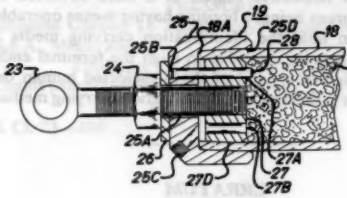
An anti-backlash screw jack has a worm gear which is supported by upper and lower annular bearings both of which remain fully loaded despite wear on the worm-gear threads and downward shifting of the anti-backlash nut. The worm gear has an integral upwardly extending sleeve portion, the lower portion of which is internally splined and the upper portion of which is internally threaded. The upper portion of the sleeve is thinner than the lower. Both portions of the sleeve are spaced radially from the load stem and an annular space is formed therebetween. Threaded on the load stem above the worm gear and within the annular space formed by the sleeve is an anti-backlash nut, the lower portion of which is externally splined to the worm-gear sleeve. There is an annular space between the upper portion of the anti-backlash nut and the internally threaded upper portion of the worm-gear sleeve into which is received a take-up nut which is externally threaded and in mesh with the upper portion of the worm-gear sleeve. An annular cap is screwed into the housing and bears down on an annular upper bearing which is outside the worm-gear sleeve. The lower race of this bearing bears against a shoulder on the worm gear which bears against the upper race of an annular lower bearing which is supported in the housing.

3,721,134

MOTION TRANSFER CONNECTING DEVICE

Arland D. Lamke, Franklin, Wis., assignor to McGraw - Edison Company, South Milwaukee, Wis.

Filed Aug. 4, 1971, Ser. No. 168,852
Int. Cl. G05g *23/00*
U.S. Cl. 74—586 **16 Claims**



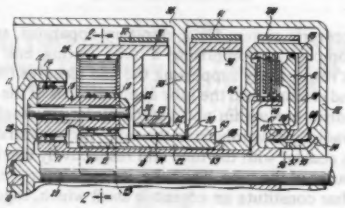
A pushrod assembly is connected between a switch actuating mechanism and a switch to transfer motion from the actuating member to the switch. The pushrod assembly has an elongated hollow fiberglass cylinder with hardware at each end for attachment to the respective mechanism and switch. The hardware at each end has an internal nut with a conical outer circumference and an end socket with a conical inner diameter. The internal nut is screwed on a threaded eyebolt, and the pulling of the nut into the end socket compresses the fiberglass tube between the outer diameter of the nut and the inner diameter of the socket. A nut and washer on the eyebolt enable adjustment of the length of the pushrod assembly.

3,721,135

COMPOUND PLANETARY GEARING

Oliver K. Kelley, Bloomfield Hills, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 21, 1970, Ser. No. 82,599
Int. Cl. F16h *57/10*
U.S. Cl. 74—761 **12 Claims**



A compound planetary gearset in which the input ring gear drives the large pinion of a compound planetary pinion and the low brake holds the large sun gear meshing with the small pinion, the second brake holds the small sun gear meshing with the large pinion and the direct drive clutch locks the small sun gear to the output shaft and the reverse brake holds a second ring gear which meshes with a reverse pinion, also meshing with the large sun gear. The small pinion and the large pinion of the compound pinion have the same number of teeth. The small pinion has a small pitch and the gears meshing with it the same small pitch, and the large pinion has a large pitch and the gears meshing with it have the same large pitch. The compound pinions are finish cut by a one piece cutter which simultaneously cuts a pair of teeth, one tooth on the large pinion and one tooth on the small pinion, so

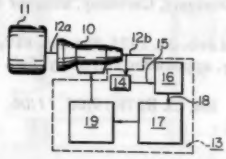
the teeth on both pinions of each compound pinion have an identical radial alignment relation to each other and all the compound pinions of the gearset are idential in this relation for equal load sharing.

3,721,136

ELECTRONIC CONTROL DEVICE FOR AUTOMATIC POWER TRANSMISSION MECHANISM

Namio Irie, Nissan-nishiterao-ryo, No. 714, Nishiterao, Kanagawa-ku, Yokohama, Japan

Filed Oct. 13, 1970, Ser. No. 80,309
Int. Cl. B60k *21/00*; F16h *3/74*; H03r *3/26*
U.S. Cl. 74—856 **1 Claim**



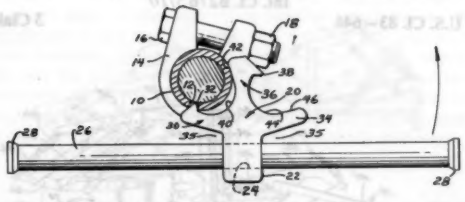
An electronic protection device adapted to prevent a vehicle engine from overrunning when a selector lever is carelessly shifted to lower speed ratios during high speed running. A sensor is provided to electronically detect the vehicle speed for generating a voltage signal corresponding thereto. A comparator circuit is provided to generate in response to the vehicle speed signal a plurality of signals each indicating that a transition to a particular speed ratio associated with the speed signal is possible preventing the vehicle engine from overrunning. A command circuit is provided to respond to the plurality of signals for generating a command signal which is applied to a hydraulic control device. The hydraulic control device is provided to respond to the command signal for controlling the automatic power transmission mechanism to prevent the vehicle engine from overrunning.

3,721,137

SPANNER TYPE TOOL

Charles L. Mosher, Owatonna, Minn., assignor to Owatonna Tool Company

Filed Sept. 24, 1971, Ser. No. 183,331
Int. Cl. B25b *13/02, 13/56*
U.S. Cl. 81—90 B **6 Claims**



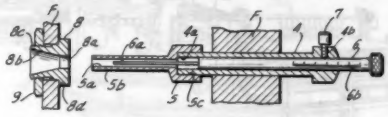
A spanner type tool particularly suited for working on automobile tie rods. The tool includes an extremely narrow base slidably receiving an elongated handle and mounting two hook-like members opening in the same circumferential direction and spaced approximately 90° apart. Dependent upon adjacent obstructions to movement of the tool when applied to work, either one of the hooks may be employed in a given job and the position of the handle varied to avoid interference.

3,721,138

DEVICE FOR CUTTING AN OUTER LAYER OF THE CONCENTRIC MULTILAYER ROD-LIKE STRUCTURE

Masato Kamimura, and Saburo Fukui, both of Tokyo, Japan, assignors to Nippon Electric Company, Limited, Tokyo, Japan

Filed Sept. 3, 1970, Ser. No. 69,287
Claims priority, application Japan, Sept. 4, 1969, 44/70444
Int. Cl. H02g *1/12*
U.S. Cl. 81—9.51 **2 Claims**



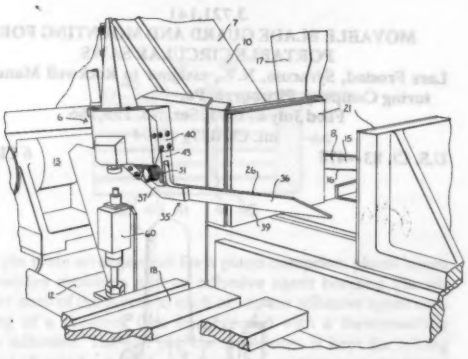
Apparatus for stripping a selected length of sheathing from a coaxial cable and the like. A die is positioned about the coaxial cable and a hollow cylindrical-shaped die is inserted beneath the sheathing to a depth commensurate with the amount to be stripped, accurate adjustment being controlled by an interior mounted slidable scale member. The two die members are brought into abrupt engagement with one another by being moved either linearly and/or rotationally relative to one another whereby the selected length of sheathing is stripped therefrom.

3,721,139

AUTOMATIC CONTROL FOR RETURN MOTION OF CUTOFF SAW HEAD

Le Roy E. Robinson, and Leslie J. Peltz, both of Savage, Minn., assignors to Continental Machines, Inc., Savage, Minn.

Filed July 19, 1971, Ser. No. 163,612
Claims priority, application Great Britain, Sept. 1, 1970, 41,789/70
Int. Cl. B23d *55/00*
U.S. Cl. 83—63 **7 Claims**

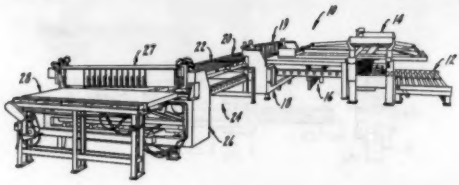


A lever mounted on the cutting head of a cutoff saw has a feeler arm that normally extends across the path of stock feed, parallel to the cutting edge of the blade to engage the stock in position to be cut and, by its disengagement from the stock as the cutting head is raised after the cut is completed, it trips a switch and prevents further elevation of the head. When the cutting head is so positioned that advancing stock can strike it, the feeler, by engagement with the stock, is displaced from its normal position, and trips another switch to effect elevation of the head and prevent stock feed advance.

3,721,140
DISCHARGE UNIT FOR PANEL CUTTING APPARATUS

James W. Campbell, Fort Worth, Tex., assignor to Wetoma Corporation, Fort Worth, Tex.

Original application Feb. 17, 1969, Ser. No. 805,943, now Patent No. 3,662,798. Divided and this application Sept. 10, 1970, Ser. No. 71,109
Int. Cl. B27b 5/18
U.S. Cl. 83—102 3 Claims

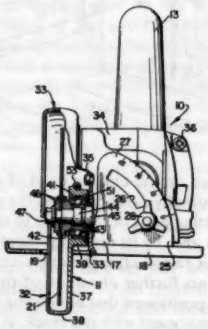


The method and apparatus for efficiently cutting accurately sized panels in an unlimited combination sizes and shapes from larger sheets. The sheets are automatically counted and stacked on a gauge table, the stack is clamped by jaws which establish a reference line relative to a cutting station, and the stack is advanced along the table for accurately dimensioned rip cuts. One or more of these cut stacks are then moved on a rip run-out unit to a cut-off infeed and gauge table where they are automatically aligned, clamped to establish a second reference line, and accurately advanced to a cut-off station where cross-cut swinging produces finished panels. The stacks are moved and gauged by either digital or analog hydraulic servo motors which accurately position the reference lines relative to the saw stations by controlled deceleration of the load to stop the stacks. At each saw station hold-downs prevent sheet displacement as the saw traverses. Each saw automatically senses cutting load and returns to its initial position immediately upon finishing a cut. Linear saw speed is controlled as a function of saw load. Means are provided to automatically remove trim and scrap.

3,721,141
MOVABLE BLADE GUARD AND MOUNTING FOR PORTABLE CIRCULAR SAWS

Lars Frostad, Syracuse, N.Y., assignor to Rockwell Manufacturing Company, Pittsburgh, Pa.

Filed July 6, 1971, Ser. No. 159,766
Int. Cl. B27g 19/04
U.S. Cl. 83—478 6 Claims

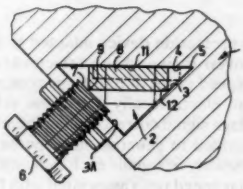


A movable guard and mounting for portable motor driven circular saws in which the movable guard is directly journalled on the blade arbor shaft through an end thrust resisting antifriction bearing means arranged to isolate the movable guard from the rotational forces of the arbor shaft and accommodate the side thrust forces transmitted to the movable guard in use during its retractile movement effected by abutting engagement with the workpiece. The antifriction bearing means, being directly carried by the blade arbor shaft, is of minimal diameter permitting its installation well within the normal centrifugal discharge path of the chips and sawdust defined by the peripheral blade enclose lips of the fixed and movable guard in closely adjacent relation to the cutter blade mounting to form a labyrinth passage with the cutter blade mounting excluding entry of chips and sawdust.

3,721,142
MECHANISM FOR FASTENING A SAW BLADE

Joachim Csaki, Stuttgart, Germany, assignor to Ackermann u. Schmitt KG

Filed Feb. 22, 1971, Ser. No. 117,447
Claims priority, application Germany, Feb. 1, 1971, P 20 15 006.5
Int. Cl. B27b 19/08, 11/06
U.S. Cl. 83—697 6 Claims

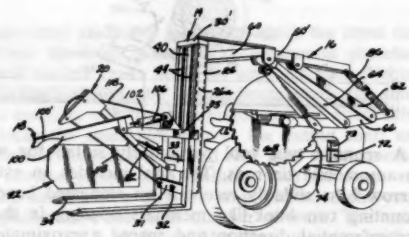


A mechanism for mounting the ends of saw blades of different sizes and configurations in a reciprocating chuck of a machine saw. The chuck is formed with an opening in which two flat inner walls intersect at an acute angle to form a corner. The saw blade is placed with one of its sides against one of the inner walls and a corner of the blade opposite the side is placed next to the other inner wall. A set screw then engages the free corner of the blade to press it firmly into the corner formed by the inner walls of the chuck.

3,721,143
PULP CUTTING AND LOADING MACHINE

Franklin W. Domres, Route 01, Manistee, Mich.

Division of Ser. No. 656,257, July 26, 1967, Pat. No. 3,519,042. This application April 14, 1970, Ser. No. 32,505
Int. Cl. B27b 5/10
U.S. Cl. 83—646 3 Claims



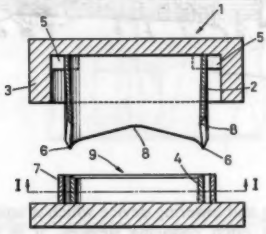
Field use apparatus for high production cutting of pulp poles into uniform length "sticks", and loading of the cut sticks onto a haulage vehicle, employing in combination with a vehicle, a special cooperative pole evener and measuring

means, special compacting and gripping means, hoisting means, and specially mounted cutoff means.

3,721,144
PUNCHING TOOL

Masaji Yamamori, Nagoya, Japan, assignor to Mitsubishi Monsanto Chemical Company, Tokyo, Japan

Filed Dec. 30, 1970, Ser. No. 102,782
Claims priority, application Japan, Feb. 25, 1970, 45/16095
Int. Cl. B26f *1/14*
U.S. Cl. 83—685 8 Claims

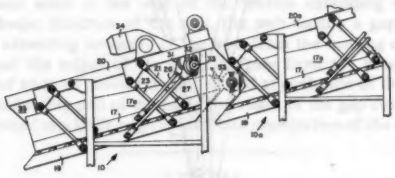


A punching machine for cutting or forming workpieces from a synthetic resinous sheet having a number of formed vessels or the like thereon which comprises a steel die punch and a cutting die, characterized in that said steel die punch is provided with a fixed punching blade member and said cutting die with a flexible cutting blade member having portions resiliently slightly inflated inside of the punching blade member, said steel die punch being adapted to be forced to enter said cutting die by which the end of the steel die punch is surrounded to thereby attain a closest possible mating of said members for cutting or forming the workpieces with clean-cut peripheral edges.

3,721,145
SHUFFLE FEED POSITIONER AND CUTTER

Louis P. Lazzarini, San Jose, Calif., assignor of a fractional part interest to Genevieve I. Hanscom, 225 Mt. Hermon Road, Lot 142, Santa Cruz, Calif., Genevieve I. Hanscom, Robert Magnuson, Lois J. Thomson, as trustees of the estate of Roy M. Magnuson

Filed Jan. 21, 1971, Ser. No. 108,311
Int. Cl. A23n *15/04*
U.S. Cl. 83—732 7 Claims

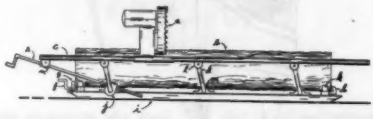


A shuffle feed structure for feeding articles which require end trimming in which two shuffle feed mechanisms are placed in tandem so as to alternately feed an article in one direction by wedge-shaped surfaces on one shuffle feed mechanism and then feed the article in the other direction by oppositely facing wedge-shaped surfaces. At the time of carrying articles into cutting engagement with the knife, a holding means is provided for each article to yieldably hold it against any tendency to become displaced due to irregularity in its contour.

3,721,146
PORTABLE SAWMILL HAVING A HORIZONTAL TRAVERSING BANDSAW

Charles E. McManama, 1734 N.W. Hoyt Street, Portland, Oreg.

Filed March 8, 1971, Ser. No. 89,919
Int. Cl. B27b *13/02*
U.S. Cl. 83—795 4 Claims

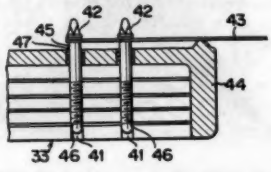


A sawmill comprising a horizontal bandsaw which traverses upon paired rail members supported above and straddling a log supporting base by parallel pivotal arms which transmit structural rigidity to the rail members from the base while also providing an adjustable relationship to the base. The essence of advantage resides in this rigidity, which, in combination with a low loading-level at which a log can be loaded upon the mill, enables new methods and systems of operation purporting to reduce over-all investment requirement and increase versatility and efficiency.

3,721,147
PIN PLATE ARRANGEMENT FOR A PIANO

Toshimune Okugawa, and Kazue Nagai, both of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Japan

Filed March 10, 1971, Ser. No. 122,677
Claims priority, application Japan, March 12, 1970, 45/20658
Int. Cl. G10c *3/04*
U.S. Cl. 84—186 WP 6 Claims



A pin plate arrangement for a piano comprises plural layers of wooden members and an adhesive agent bonding the adjacent ones of the layers to each other, the adhesive agent consisting of a pre-preg film impregnated with a thermosetting resin adhesive. The pin plate arrangement is kept for a long period of time having a less and constant moisture content and a smaller drop in the pin-holding power.

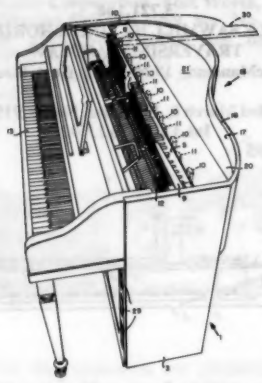
3,721,148
PIANO

Edmund S. Goss, 3561 Homestead Road, Santa Clara, Calif.

Filed Nov. 15, 1971, Ser. No. 198,512
Int. Cl. G10c *3/06*
U.S. Cl. 84—189 5 Claims

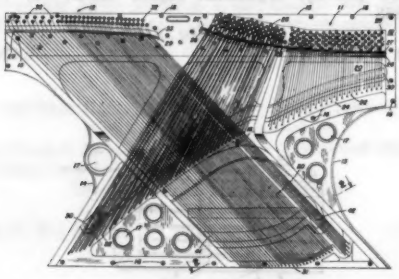
An improved upright piano having a case with a reverberating sound chamber secured about the exterior of the case and

the vertical sounding board of the piano. Said reverberating sound chamber establishes a harp-shaped wall of which the



lateral edges are secured to the back side of the case. A secondary sounding board is engaged to the back side of the case adjacent to and spaced from said sounding board.

3,721,149
SCALE FOR UPRIGHT PIANOS
Salvatore Pagliaro, 21-16 21st Avenue, Astoria, N.Y.
Filed Oct. 26, 1971, Ser. No. 191,991
Int. Cl. G10c *3/08*
U.S. Cl. 84—197 **7 Claims**

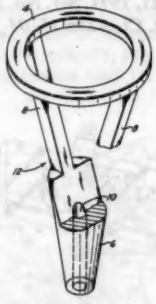


A scale for upright pianos adapted to provide improved tonal quality and volume is disclosed, in which the bass scale includes the strings corresponding to at least four notes at the low end of the treble scale in a conventional piano. The bass strings and the four treble note strings are positioned parallel to each other and extend diagonally across the piano scale at approximately a 45° angle with respect to a horizontal reference line to obtain maximum string length without increasing the overall piano size, and are supported by a pair of bass bridge sections disposed therebeneath. The first section of the bridge is in the form of a continuous curve and is adapted to receive all of the bass strings, and the second section is of irregular shape disposed approximately perpendicular to the first section and receives the strings corresponding to the four treble notes.

3,721,150
PITCH RAISING AND LOWERING DEVICE FOR GUITARS
Rickie R. Hoffman, and Roland F. Hoffman, both of P.O. Box 25, RR1, Lemmon, N. Dak.
Filed Oct. 20, 1971, Ser. No. 190,830
Int. Cl. G10d *3/00*
U.S. Cl. 84—313 **8 Claims**

A pitch raising and lowering device which is unique in that, unlike prior art pitch changing devices, it is operatively mounted on the usual key-equipped string-end tuning head of the instrument. It comprises a rod having a thumb-actuated lever poised alongside the neck of the instrument (guitar or the like). This rod embodies a crank portion rockably mounted in a fixed bearing bracket. An arm of the crank carries and actuates a mechanical finger which has a terminal depressor which overlies one or more strings in a manner to optionally stress and release the same while the instrument is being played. When the lever is pressed the crank actuated mechanical finger progressively bends and tensions the string (or strings) and produces an ascending and diminishing glissando, that is, a sliding sound comparable to and obtainable only with a Hawiian steel guitar.

3,721,151
TEACHING AID
Harold L. Dimond, 10629 Grimsby Lane, Cincinnati, Ohio
Continuation-in-part of Ser. No. 113,891, Feb. 9, 1971, abandoned. This application July 19, 1971, Ser. No. 163,724
Int. Cl. G10d *9/02*
U.S. Cl. 84—398 **10 Claims**



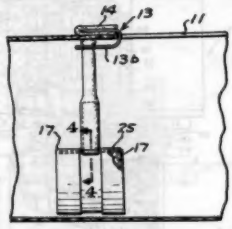
A teaching aid for use in combination with brass instruments composed of a rim, a tapered shank and one or more arms, each of which is securedly attached at one end to said rim and the other end thereof to the larger end of said tapered shank. In a preferred embodiment the tapered shank is provided with an opening extending longitudinally therethrough.

3,721,152

HUMIDIFIER ATTACHMENT FOR GUITARS AND THE LIKE

Walter G. Von Meyer, 1504 Port Jefferson Road, Sidney, Ohio

Filed April 27, 1972, Ser. No. 248,016
Int. Cl. G10g 7/00
U.S. Cl. 84—453 8 Claims



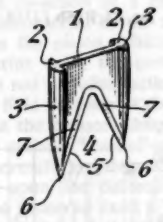
A humidifier attachment for a guitar which comprises a mounting clip for attachment to the opening of the guitar, resilient arms extending from said mounting clip and a housing mounted on the resilient arms and supporting a body of porous material containing water within the housing of the guitar or the like.

3,721,153

RELATING TO NAILS

Sidney Rosen, 11 Park Lodge, Friern Park, London, England

Filed Sept. 8, 1971, Ser. No. 178,552
Int. Cl. F16b 15/00
U.S. Cl. 85—11 1 Claim



A nail of "I" section having a flat web the flanges along the opposite sides of the web of the section extending in the lengthwise direction of the nail, the web having a gap of V form extending inwardly of the web from the leading end of the nail the edges of the gap diverging from the inner end thereof so as to provide a pointed end at each side of the web at said leading end of the nail. The edges of the gap can each be formed as a knife edge to facilitate penetration of the nail.

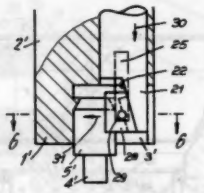
3,721,154

TOOL CARRIER CONSTRUCTION

Berthold Leibinger, Gerlingen; Eugen Herb, Ditzingen, and Hans Klingel, Korntal, all of Germany, assignors to Trumpf & Co., Stuttgart, Germany

Filed Aug. 18, 1971, Ser. No. 172,675
Claims priority, application Germany, April 9, 1970, P 20 43 855.5
Int. Cl. B26d 1/06
U.S. Cl. 83—698 10 Claims

A tool carrier which is adapted to be arranged on a ram or work spindle of a processing machine, particularly a machine tool, comprises a tool carrier formed as a laterally opened slot of the work spindle and including a slideable member which reciprocates in a bore overlying the outer end of the slot and closes the outer end to hold the tool in a position when it is lowered alongside the tool. The slot is advantageously provided with a projection in the form of an engagement ledge which fits under a recessed end of the tool in order to hold it in position.



ERRATUM

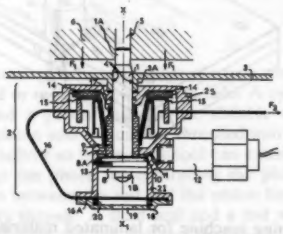
For Class 85—11 see:
Patent No. 3,721,153

3,721,155

SAFETY DEVICE FOR LOCKING A MISSILE ON ITS LAUNCHER OR IN ITS CONTAINER IN EITHER THE TRANSPORT OR THE LAUNCHING POSITION

Emile Stauff, Versailles; Michel Maree, Chilly-Mazarin, and Jacques Roze des Ordons, Paris, all of France, assignors to Societe Nationale Industrielle Aerospatiale, Paris, France

Filed Feb. 19, 1971, Ser. No. 116,959
Claims priority, application France, Feb. 23, 1970, 7006411
Int. Cl. F41f 3/04
U.S. Cl. 89—1.807 7 Claims



A safety device for locking a missile either in the transport position in its container, or in the firing position on its launcher, in which means maintains electric circuit for energizing the missile propellant igniters short-circuited as long as the missile is not in a condition to be fired, and actuating means with movable restraining means permitting to fetch the missile from an initial locking position to a final retracted position and latching said movable means in their final retracted position.

3,721,156

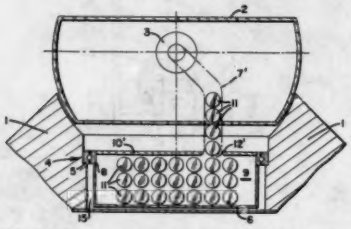
ARMORED VEHICLE TURRET

Hans-Georg Schallehn, Hummelweg, Germany, assignor to Rheinstahl Aktiengesellschaft, Essen, Germany

Filed Sept. 5, 1969, Ser. No. 857,294
Int. Cl. F41h 5/20
U.S. Cl. 89—36 K 1 Claim

An armored vehicle in which a turret is mounted in the well of a vehicle body for rotation about a vertical axis, there being

an ammunition bunker located outside the turret and in the well. The bunker is arranged centrally with respect to the turret and is rotatable therewith about the vertical axis, and is

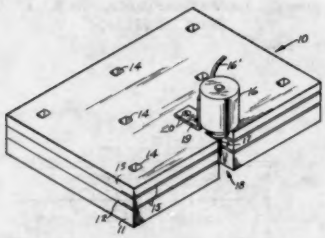


connected to the turret for movement with only those parts of the turret which partake only of rotation of the turret about the vertical axis.

3,721,157
LAMINATED TRIMMER FOR HIGH PRESSURE LAMINATED MATERIALS

Charles Bacher, 710 Island Ave., McKees Rocks, Pa.

Filed June 3, 1971, Ser. No. 149,531
Int. Cl. B23c *3/12*
U.S. Cl. 90—18 **3 Claims**



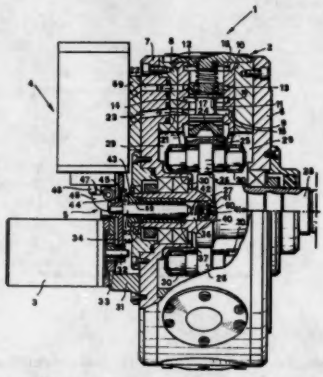
A trimming machine for laminated materials. This device includes a multiple number of plates to which is secured a motor with a bit which will trim the edges of materials to a finished edge.

3,721,158
ELECTRO HYDRAULIC MOTORS

Nuzio D'Addea, Cinisello; Cesare Panzeri, Macherio, and Ruggero Chiappulini, Sesto San Giovanni, all of Italy, assignors to Consiglio Nazionale Delle Ricerche, Rome, Italy

Filed Feb. 2, 1971, Ser. No. 112,000
Claims priority, application Italy, Feb. 6, 1970, 67382 A/70
Int. Cl. F15b *21/02*
U.S. Cl. 91—35 **10 Claims**

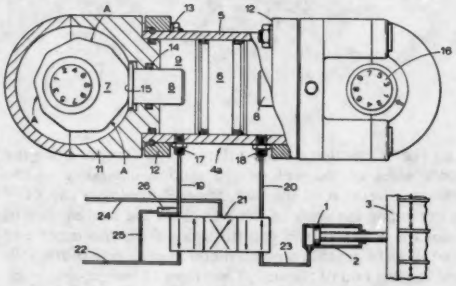
An electro-hydraulic motor is described in which a rotary hydraulic motor is slaved to a stepping pilot motor by the operation of a fluid distributor valve which is controlled by a differential device responsive to the angular discrepancy between the shafts of the pilot and hydraulic motor. In this invention, the differential device consists of a toothed wheel coupled to the electric pilot motor to drive a shaft which is slidable coaxially and rotatable relative to the hydraulic motor shaft: a frontal cam carried by the latter shaft cooperates with a roller mounted on a face of the toothed wheel to cause proportional axial displacement of the differential shaft, which is transmitted to the spool of the distributor valve, preferably mounted at right angles to the hydraulic motor shaft.



3,721,159
HYDRAULIC CONTROL DEVICES

Wolfgang Schwandt, Altlunen, Germany, assignor to Gewerkschaft Eisenhutte Westfalia, Wethmar near Lunen, Westfalia, Germany

Filed Dec. 31, 1970, Ser. No. 103,081
Claims priority, application Germany, Jan. 30, 1970, P 20 04 056.6
Int. Cl. F15b *11/16*
U.S. Cl. 91—418 **1 Claim**

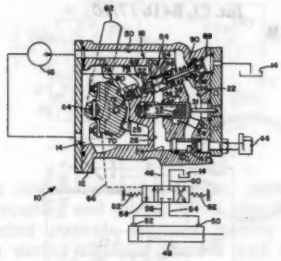


A hydraulic control device connected to one of a series of shifting rams in a hydraulic system for shifting a conveyor in a mine working. The device is composed of a piston disposed in a cylinder and one or more displaceable stop members for limiting the movement of the piston and thereby regulating the quantity of pressure medium supplied to the ram. The position of the, or each, stop member can be altered with a cam or similar eccentric rotatable member connected to a manually operable control knob. An automatic change-over valve is preferably used to connect the working chambers on either side of the piston to either a pressure source or to the ram.

3,721,160
HYDRO-MECHANICAL DETENT MECHANISM

Carl Edwin Kittle, Cedar Falls, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Oct. 26, 1970, Ser. No. 84,053
Int. Cl. F15b *13/04*
U.S. Cl. 91—426 10 Claims



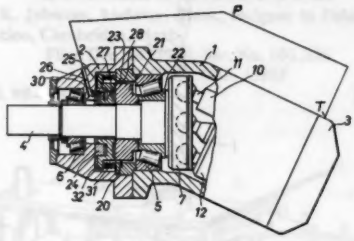
A detent mechanism is provided for holding a selective control valve in a pair of active positions respectively wherein one or the other of the work ports of a double-acting hydraulic cylinder is connected to a source of fluid pressure while the remaining work port is connected to a sump. The detent mechanism includes a cam which is fixed to and swings with a lever for shifting the control valve. When the lever is swung to shift the control valve to one or the other of the active positions, one or the other of a pair of recesses in the cam is respectively placed in register with a roller of a cam-following detent element. A piston rod is bearingly engaged with the detent element and a force for holding the roller in the recesses is derived from the co-action of a biasing spring positioned against a piston carried by the rod and a pressure drop coupled across the piston, which pressure drop is induced by a metering valve for metering flow to the cylinder. The piston rod includes sections of different diameters exposed to fluid pressure at the opposite sides of the piston and when the pressure drop across the piston falls to zero as the cylinder reaches an end of a stroke, the pressure then normally existing at the opposite sides of the piston acts upon the different axially-projected areas of the rod and piston to exert a force substantially equal and opposite to that of the biasing spring. Thus, the detent force tending to keep the roller in one or the other of the recesses is reduced to the point where the force to a return-to-neutral spring acting on the control valve overcomes the detent force and moves the cam to disengage the roller from the recess.

3,721,161
AXIAL PISTON HYDRAULIC APPARATUS

Gerhard Bobst, Oensingen, Switzerland, assignor to Von Roll AG, Gerlafingen, Switzerland

Filed Dec. 24, 1970, Ser. No. 101,362
Claims priority, application Switzerland, Dec. 30, 1969, 19443/69
Int. Cl. F01b *3/00, 13/04*
U.S. Cl. 91—486 13 Claims

To decrease mechanical loading on the roller thrust bearings in hydraulic pressure fluid apparatus, a hydrostatic axial slide bearing is provided, having a rotating part with an axially directed face secured to the rotating elements of the apparatus; and a stator part, formed as an axially movable element, such as a piston, within a cylinder which has pressure fluid applied thereto from a pressure fluid tap of the apparatus, the piston being formed with an opening, preferably including a choke, through which pressure fluid is applied in

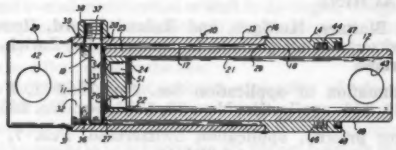


the region between the piston and the axially facing surface of the rotor element, to provide a counterforce against the mechanical force exerted against the thrust bearing.

3,721,162
FLUID-ACTUATED CYLINDER ASSEMBLAGE

Joseph T. Kulhavy, Davenport, Iowa, assignor to J. I. Case Company, Racine, Wis.

Filed Jan. 10, 1972, Ser. No. 216,634
Int. Cl. F01b *29/00*; F16j *1/00*
U.S. Cl. 92—128 7 Claims



A fluid-actuated cylinder assemblage of a type which can be readily serviced or repaired, even in the field. A cylinder has an end cap and a piston and rod are slidable within the cylinder. The piston and rod can be threaded into assembly, and the rod is hollow so that a work tool can extend into the rod and engage the piston for controlling the piston in the screwing action between the rod and the piston for assembly and disassembly thereof. A fluid seal and a rod wiper exist between the cylinder and the rod and the seal is spaced inwardly from the end of the cylinder but is accessible for replacement when the rod is unscrewed relative to the piston and is removed from the cylinder. Also, the end cap and a fluid port and the piston itself are all arranged so that fluid can enter the cylinder to provide a working force on the piston, even when the piston is in its end limit position abutting a wall or face presented on the end cap.

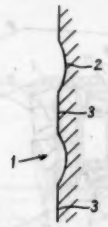
3,721,163
PISTONS

Harold Taylor Hill, and Ronald Morris Caton, both of Sway, Lymington, England, assignors to Wellworthy Limited, Lymington, England

Filed Sept. 23, 1970, Ser. No. 74,593
Int. Cl. F16j *1/08*
U.S. Cl. 92—158 7 Claims

This invention relates to pistons comprising a crown and side wall. In order to enhance lubrication of the skirt, the side wall is formed with a circumferentially extending helical

groove; at least a part of this groove has a predetermined profile. For example, that part of the groove next adjacent the crown has a predetermined profile and the profile of at least a portion of the remainder of the groove is of random nature.



The groove may either be symmetrical or asymmetrical. The invention also relates to a method for making a piston which includes the step of cutting in the side wall thereof a circumferentially extending helical groove, at least part of which is of predetermined profile.

ERRATUM

For Class 94—10 C see:
Patent No. 3,721,168

3,721,164

PHOTOELECTRIC DEVICE FOR RECORDING SYMBOLS AND FOR DRAWING SMALL DIAGRAMS AT HIGH RECORDING AND DRAWING SPEED FOR USE IN AN AUTOMATIC DRAFTING MACHINE

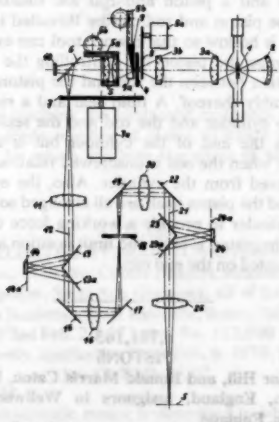
Karl Blattner, Kuttigen, and Roland Picard, Rombach, Switzerland, assignors to G. Coradi A.G., Zurich, Switzerland

Continuation of application Ser. No. 796,981, Feb. 6, 1969. This application Nov. 30, 1971, Ser. No. 203,175

Claims priority, application Switzerland, Feb. 7, 1968, 1,994/68

Int. Cl. G03

U.S. Cl. 95—1 R **10 Claims**



A virtually inertialess automatic drafting machine for recording symbols and diagrams, at high recording speeds, on a photographic layer. An adjustable illuminating system produces an image of a line-thickness-determining aperture, the image being directed to a pair of rotatable mirrors so that it is deflected in a direction of one or the other coordinates and onto the photographic layer, the mirrors being controlled by signals supplied by a storage medium.

3,721,165

PHOTOTYPE COMPOSING MACHINE WITH ROTARY CHARACTER DRUM

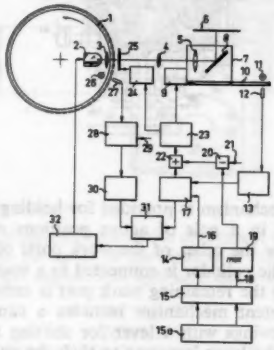
Alois Knoll, Bahnhofstrasse 33, 6079 Buchschlag, Germany

Filed Dec. 1, 1970, Ser. No. 93,988

Claims priority, application Germany, Dec. 1, 1969, P 19 60 161.7

Int. Cl. B41b *17/10*

U.S. Cl. 95—4.5 R **4 Claims**



A phototype composing machine having a continuously rotating character drum and a continuously moving line composing carriage is disclosed. The arrangement is such that by varying the carriage speed and the position from which a character is projected from the drum, the image of the character will be properly located on the recording medium.

3,721,166

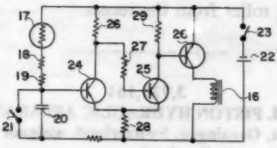
COMPENSATED ELECTRICALLY CONTROLLED FOCAL PLANE SHUTTER

Akio Yanagi; Shoichiro Kakuta, both of Tokyo, and Kintaro Yata, Ikeda, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka-shi, Japan

Filed Nov. 13, 1970, Ser. No. 89,407

Int. Cl. G03b *7/08, 9/62, 9/34*

U.S. Cl. 95—10 CT **2 Claims**

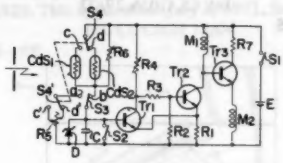


Circuitry is provided for determining the time delay for release of a shutter curtain from a cocked position to compensate for exposure errors generated by the overlapping of first and second shutter curtains in their cocked positions. The non-uniformity between different shutter mechanisms is corrected by adjustment of a variable resistance. A switching circuit responsive to a voltage related to the brightness of an object as well as the required compensation releases the second curtain to terminate the exposure.

3,721,167
EXPOSURE VALUE CONTROLLING APPARATUS

Mitsutoshi Ogiso, Kawasaki-shi, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 29, 1969, Ser. No. 872,030
Claims priority, application Japan, Nov. 6, 1968, 43/81,430
Int. Cl. G03b 7/08
U.S. Cl. 95—10 CT 15 Claims

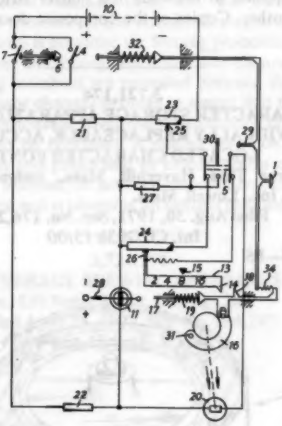


Timing circuit arrangements for control of camera aperture opening and shutter speed wherein a single timing capacitor controls aperture opening in one timing operation during charging thereof and thereafter controls shutter speed in a second timing operation during discharge thereof.

3,721,168
PHOTOGRAPHIC CAMERA

Rolf Noack, and Heinz Schulze, both of Dresden, Germany, assignors to VEB Pentacon, Kamera-und Kinowerke, Dresden, Germany

Filed Aug. 2, 1971, Ser. No. 167,941
Int. Cl. G03b 7/02
U.S. Cl. 95—10 C 5 Claims

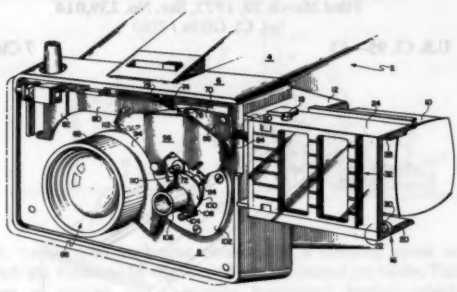


The photographic camera is provided with a photoelectric exposure-measuring apparatus which functions in dependance upon the light passing through the objective lens. The measurement may be made with the diaphragm fully open or stopped down to an aperture at which an exposure is to be made. A change-over switch is provided by which either the variable resistor, which is variable together with the diaphragm-setting member in the case of open aperture measurement, or a substitute resistor lying in parallel therewith in the case of working aperture measurement, is connectible into the measurement circuit. For the optional measurement either with open aperture or with working aperture, measuring key means are provided coupled with the change-over switch so that on selection of open aperture measurement the variable resistor is connectible into the measurement circuit and on selection of working aperture measurement the substitute resistor is connectible into the measurement circuit.

3,721,169
RANGE RESPONSIVE FLASH UNIT

Bruce K. Johnson, Andover, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 24, 1970, Ser. No. 101,336
Int. Cl. G03b 3/02, 15/03
U.S. Cl. 95—11 L 26 Claims



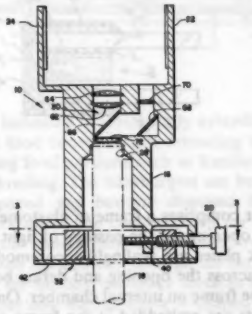
The subject disclosure describes a flash unit, the light output of which is automatically adjusted throughout a given range of illumination values by mechanical means in conformance with the distance settings of a camera with which it is incorporated to provide so-called "follow-focus" operation. A cooperating manually operable "trim" means enables an optional overall modification or shift in the degree of light output independent with the aforesaid distance settings. The flash unit may be of the electronic flash or "strobe" type or may comprise a flash cube or the like.

The subject flash unit includes a plurality of telescoping apertured plates which are sequentially advanced through a cam and linkage assembly connected to the camera focus adjusting means so as to selectively vary the net aperture through which illumination from the flash lamp may travel to a subject.

3,721,170
APPARATUS FOR ADAPTING A REFLEX CAMERA TO USE WITH A MONOCULAR MICROSCOPE

Bruce K. Johnson, Andover, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

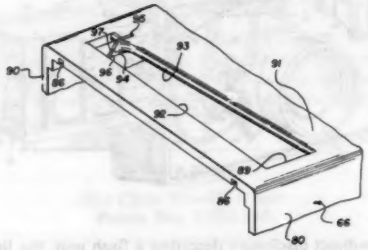
Filed April 25, 1972, Ser. No. 247,410
Int. Cl. G03b 29/00
U.S. Cl. 95—12 2 Claims



An apparatus for attaching a reflex camera, with an automatic exposure control, to a standard monocular microscope is disclosed. The apparatus includes a self-centering clamp to attach it to the draw tube of a monocular microscope and a

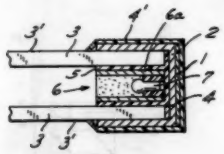
support for holding the camera in alignment with the optic axis of the microscope. The support contains an eyepiece modified to provide a way of operating the camera's automatic exposure control and an optional polarizer for dark field microscopy. It does not interfere with the camera's automatic operation.

3,721,171
PRINT STRIPPING DEVICE
Frederick W. Kern, Fairport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed March 29, 1972, Ser. No. 239,014
Int. Cl. G03b *17/50*
U.S. Cl. 95—13 **7 Claims**



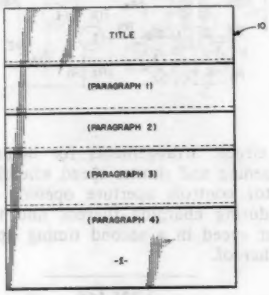
A self-processing camera is provided for use with film units comprising a preregistered, integral image-recording unit separably attached along its lateral margins to side rails of a rigid frame. As each film unit moves endwise in the camera during processing, its image-recording unit is separated from the frame and ejected through an exit slot in the camera housing to provide the desired photographic print. A novel stripping device initiates the separation at a leading corner of the image-recording unit and then progressively detaches that unit from the frame by means of an angularly disposed stripping shoe that guides the image-recording unit into and through the exit slot.

3,721,172
CAPPING SHUTTER WITH EXPLOSIVE CHARGE OF CARBON POWDER
Frank Frungel, and Horst Lohse, both of Hamburg, Germany, assignors to Impulsphysik GmbH, Hamburg, Germany
Filed Nov. 24, 1970, Ser. No. 92,440
Int. Cl. G03b *9/08*; G02f *1/28*
U.S. Cl. 95—53 **22 Claims**



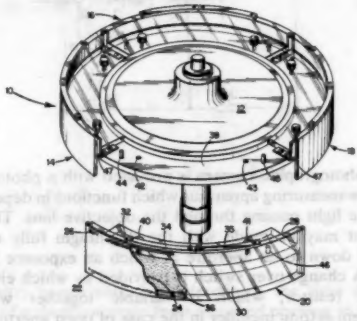
A shutter comprises a frame of elastomeric material which bounds an opening for the passage of light. A pair of parallel transparent plates are sealingly accommodated in the frame exteriorly across the opening and define between themselves and with the frame an internal chamber. One or more shutter-closing units are embedded in the frame and each include a housing or shell having an open side communicating with the camber, a charge of carbon powder accommodated in the open shell with a frangible layer extending across the open side to retain the carbon powder in the shell until the time of operation, and an explosive charge which can be triggered electrically and which blows the carbon powder into the chamber to thereby close the shutter, that is prevent further passage of light through the opening.

3,721,173
APPARATUS FOR COMPOSING DOCUMENTS
Leo Jaffe, Bassett Tower, El Paso, Tex.
Filed Dec. 12, 1969, Ser. No. 884,613
Int. Cl. G03b *27/02*
U.S. Cl. 95—85 **2 Claims**



Each paragraph of a document is separately typed to define a master strip. An identical distance is maintained between the printed matter and the top of each strip, and a second distance is maintained between the printed matter and the bottom of each strip. The several master strips are placed in a document carrier. The carrier is in turn placed in a composition board for visual alignment of the individual paragraphs. Static electricity is applied to maintain the master strips in alignment with each other. Copies of the composite document are then made.

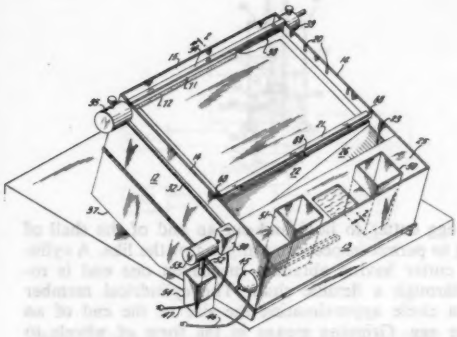
3,721,174
CHARACTER STORAGE APPARATUS WITH INDIVIDUALLY REPLACEABLE, ACCURATELY LOCATED CHARACTER FONTS
James Alfred Tidd, Haverhill, Mass., assignor to Graphic Systems, Inc., Lowell, Mass.
Filed Aug. 30, 1971, Ser. No. 176,222
Int. Cl. G03b *15/00*
U.S. Cl. 95—85 **13 Claims**



This disclosure depicts character storage apparatus especially for use in a phototypesetting machine or the like for storage characters for selective presentation at a character display location, including a plurality of discrete character carriers each carrying a font of characters which revolve on a cylinder of revolution when the phototypesetting machine is in

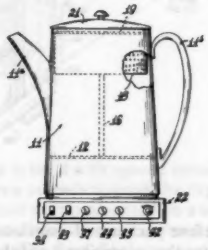
operation, the carriers being dimensionally rigid at least in the said cylinder of revolution. The apparatus includes carrier mounting means and means for attaching the carriers to the carrier mounting means such that the characters are located with extreme accuracy.

3,721,175
PHOTOGRAPHIC PROCESSING APPARATUS
Samuel Needleman, 177 Louis Street, Maywood, N.J.
Continuation-in-part of Ser. No. 826,501, May 21, 1969, Pat. No. 3,601,029. This application July 2, 1971, Ser. No. 159,420
Int. Cl. G03d *13/04*
U.S. Cl. 95—95 **4 Claims**



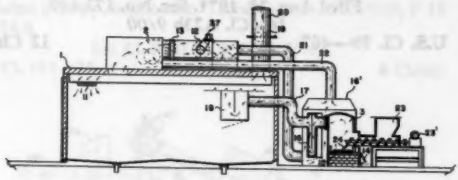
A photographic sheet material processing apparatus wherein, in one embodiment, the apparatus comprises a platen which may be tilted to present an inclined surface. A solution applicator channel, flush with the surface of the platen, extends thereacross and communicates with a solution chamber. A pump is provided for forcing processing solutions into the chamber and through the applicator channel. Solution flow modifying members are provided between the chamber and the applicator channel in order to assure that the solution flows in a uniform stream over the active surface of the platen. The material to be processed is placed emulsion side down over the platen and positioned to extend above and beyond the applicator channel. In another embodiment, the platen is of arcuate shape and is placed in an upright position.

3,721,176
BEVERAGE BREWING APPARATUS
Malcolm Logan, 535 Noble Street, Chicago, Ill.
Filed April 15, 1971, Ser. No. 134,147
Int. Cl. A47j *31/00*
U.S. Cl. 99—280 **11 Claims**



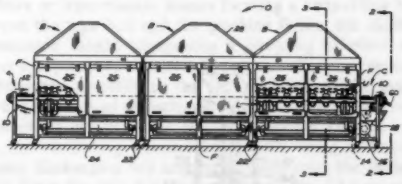
Beverage brewing apparatus of the character having a container for water and a basket to contain ground coffee. It also includes a flow stem supporting the basket, at the lower end of which there is an electrically actuated pump operable to cause fluid to flow upwardly through the flow tube and spill over into the basket. Suitable means is provided for heating the water to brew the coffee or to re-heat same.

3,721,177
COMMERCIAL BARBEQUE COOKER
William E. Booker, 3039 Kingston Pike, Knoxville, Tenn.
Filed Nov. 5, 1971, Ser. No. 195,969
Int. Cl. A23b *1/04*
U.S. Cl. 99—331 **9 Claims**



A commercial barbeque cooker has a cooking room in which the meats to be barbequed are supported on racks. The room is heated by a remote hardwood burner which discharges hot smoke and gases into the circulating duct system of the room. The meat is subjected to the heat of the combustion gases from the hardwood burner in the range of 225 to 260°F. to barbeque the meat. Smoke from a separate smoke generator is admitted into the circulating duct system of the room as required. The circulation of the hot combustion gases is uniform and downward from the top of the room through the meat in the racks and then upwardly for recirculation.

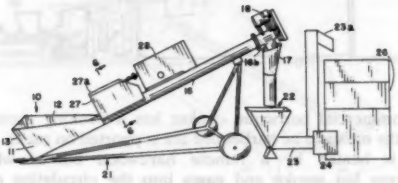
3,721,178
FOOD BROILER
Robert H. Szabrak, and Richard A. Smith, both of Sandusky, Ohio, assignors to Sam Stein Associates, Inc., Sandusky, Ohio
Filed March 25, 1971, Ser. No. 128,057
Int. Cl. A47j *37/00*
U.S. Cl. 99—386 **2 Claims**



A food broiler including a horizontally extending furnace having an endless food conveyor belt extending through the furnace for carrying food portions such as hamburger patties therethrough for broiling. The hamburgers are broiled by an upper row of spaced gas burners disposed horizontally through the furnace above the conveyor belt for heating the upper surfaces of the hamburgers, and a lower row of spaced gas burners disposed horizontally through the furnace below the conveyor belt for heating the lower surfaces of the hamburgers. Each upper row burner has a V-shaped heat baffle disposed above the burner (in inverted V position) for directing heat down onto the hamburgers. Each lower row burner has a W-shaped burner plate disposed above it to radiate heat to the bottom of the hamburgers and to hold grease drippings

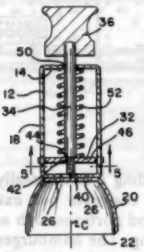
from the hamburgers for flame flare-up to brown the hamburgers. The furnace includes a plurality of substantially identical individual modular furnace sections secured together to form the furnace, whereby the length of the furnace may be effected by adding or subtracting one or more of such modular sections to increase or decrease broiling time. The broiler is provided with a hamburger removal mechanism for removing the hamburgers from the conveyor belt and delivering them to a discharge chute.

3,721,179
CHEMICAL APPLICATOR FOR GRAIN
Robert D. Applegate, Attica, Ind., assignor to Driall Driers, Inc.
Filed Aug. 20, 1971, Ser. No. 173,449
Int. Cl. A23b *9/00*
U.S. Cl. 99—487 12 Claims



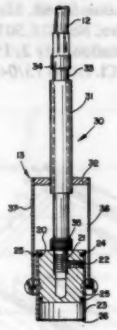
Disclosed is an applicator for applying liquid preservatives to grain as it is moved by an auger conveyor from a receiving bin; a switch, responsive to the grain level in the receiving bin, assures that operation of the auger conveyor and flow of the liquid preservatives can occur only when the grain level in the receiving bin is above the intake end of the auger conveyor thus providing a seal preventing discharge of the liquid or its fumes into the atmosphere.

3,721,180
EGGSHELL OPENER
Herman D. Strang, 308 Ridge, Algonquin, Ill.
Filed Jan. 18, 1971, Ser. No. 107,277
Int. Cl. A47j *43/14*
U.S. Cl. 99—571 4 Claims



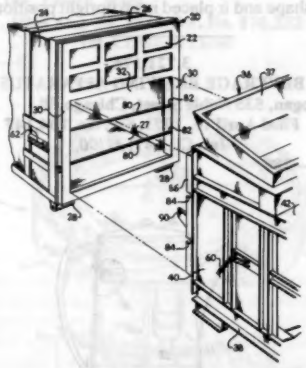
A sanitary eggshell opener includes a circular skirt dependent from a fixed frame and a traveling ram biased toward said skirt. The motion of the ram is limited by guide means to movement along a line which is perpendicular to the center of the plane of the mouth of the dependent skirt which is adapted to be received over an end of an egg.

3,721,181
EGG CUTTER
Douglas S. Fraser and Charles E. Bender, New Paltz, N.Y., assignors to Cenco Medical/Health Supply Corporation, Chicago, Ill.
Filed Oct. 30, 1970, Ser. No. 85,386
Int. Cl. A23b *5/00*; B25b *3/00*; B23q *3/157*
U.S. Cl. 99—576 4 Claims



An egg cutter to hold and cut an end of the shell of an egg to permit inspection, sampling or the like. A cylindrical cutter having abrading means on one end is rotated through a flexible shaft. The cylindrical member is on a circle approximating the size of the end of an average egg. Gripping means in the form of wheels to engage the end of the egg assures accurate positioning as the cutter is moved against the egg. The gripping means is retractable to permit the cutter to be used independently.

3,721,182
STATIONARY REFUSE PACKER AND ASSOCIATED CONTAINER APPARATUS
Donal W. Chaney, Galion, Ohio, assignor to Harsco Corporation, Camp Hill, Pa.
Filed Dec. 30, 1970, Ser. No. 102,833
Int. Cl. B30b *13/00*
U.S. Cl. 100—35 5 Claims



A stationary refuse packer and associated portable refuse container apparatus that comprises a novel automatic control system adapted for sophisticated control of the packer ram that loads the container. Such control includes jog type cycling wherein portions of the packer ram cycle can be precisely individually controlled; single cycling wherein the

machine will go through one complete cycle and then stop; automatic cycling wherein the machine will cycle continuously until stopped; and timer cycling wherein the machine will continue to cycle until automatically stopped after a predetermined period of time. In addition, other aspects of control can be uniquely accomplished.

3,721,183

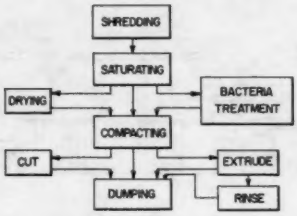
METHOD OF DISPOSING BULK RUBBISH

John V. Dunlea, Jr., 2 Wellesley Avenue, Wellesley, Mass.

Continuation-in-part of Ser. No. 888,268, Dec. 29, 1969, abandoned. This application Nov. 8, 1971, Ser. No. 196,822

Int. Cl. A61l *11/00*; **B30b** *13/00*

U.S. Cl. 100—39 **1 Claim**



Bulk rubbish is shredded, saturated with a binding agent, compacted on a continuously extruded or piecemeal basis, reduced in size, rinsed and disposed of either as land fill or dumped at sea. Further steps include treatment of the rubbish to kill bacteria, drying prior to compaction and cutting or chipping the compacted rubbish into small pieces.

3,721,184

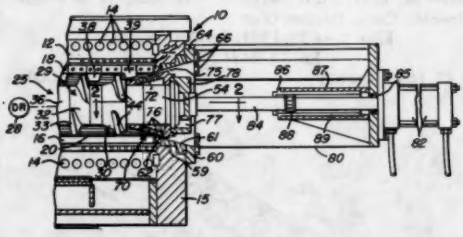
MECHANICAL SCREW PRESS

Alfred W. French, and Forest J. Starrett, Jr., both of Piqua, Ohio, assignors to The French Oil Mill Machinery Company, Piqua, Ohio

Filed July 9, 1971, Ser. No. 161,132

Int. Cl. B30b *9/14, 3/02, 15/00*

U.S. Cl. 100—117 **15 Claims**



A cylindrical cage is lined with spaced screen bars to define drainage slots, a screw extends through the cage and has a plurality of axially spaced worms mounted on a shaft, and axially spaced stationary breaker lugs project inwardly between the flights of the worms. The final discharge worm has a tapered body and two diametrically opposed helical flights each of which extend circumferentially about 170°. The flights are effective to balance lateral forces acting on the discharge end portion of the screw and provide for generally axial flow of material between the flights. The final discharge worm is also adapted to be pulled axially from the shaft without opening the cage, by a fluid cylinder which primarily serves to position a frusto-conical drainage sleeve within a surrounding discharge ring to vary the size of the discharge orifice.

3,721,185

DEVICE FOR HOT EMBOSSING WITH COLORED ROLL FOILS

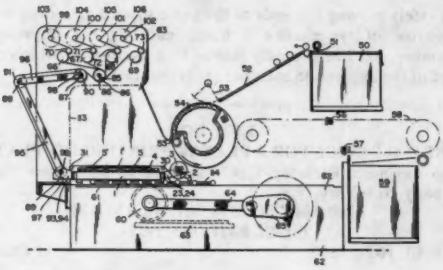
Hugo Rambausek, Wiesloch, Germany, assignor to Heidelberger Druckmaschinen Aktiengesellschaft, Heidelberg, Germany

Filed Nov. 20, 1970, Ser. No. 91,330

Claims priority, application Germany, Nov. 22, 1969, P 19 58 824.0

Int. Cl. B41f *3/18*; **B41k** *3/58*

U.S. Cl. 101—25 **6 Claims**



Cylinder printing press includes a press bed, a device for hot embossing with colored roll foil including means for mounting a plurality of stamping dies on the press bed, a spindle for carrying a colored foil roll located at one end of the press bed, foil transfer rollers and a take-up spindle for depleted colored foil roll located at the other end of the press bed, and a plurality of guide rods disposed between the spindles for guiding the foil in a path over and slightly spaced from the stamping dies, a machine frame for carrying the foil transfer rollers, the foil take-up spindle being mounted on the machine frame, oscillating drive or transmission means forming a connecting bridge between the type bed and the machine frame, the oscillating transmission means comprising a coupling member and a rocker arm pivotally connected to one another and respectively connected pivotally to the type bed and to the machine frame, a plurality of deflecting rollers mounted respectively at the pivotally points of the coupling member and the rocker arm, the oscillating transmission means being actuable for drawing discharging foil lengths stepwise over the deflecting rollers from the foil transfer rollers and the take-up spindle located at the machine frame.

3,721,186

ROCKABLE IMPRESSION DEVICE FOR A PRINTING MACHINE

Paul Thevis, Oberndorf; Adolf Schneider, Altoberndorf, and Horst Jakubaschk, Oberndorf, all of Germany, assignors to Olympia Werke AG, Wilhelmshaven, Germany

Filed Jan. 20, 1971, Ser. No. 108,104

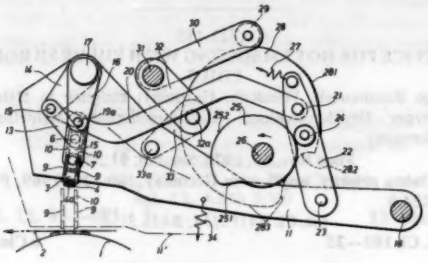
Claims priority, application Germany, Feb. 5, 1970, P 20 05 143.8

Int. Cl. B41f *1/04*

U.S. Cl. 101—297 **10 Claims**

An impression device for a parallel printer, in which a row of characters or digits is imprinted by a row of types, has an impression member with a convex curved impression surface

rocking on a copy sheet and on an inked ribbon covering the row of types so that imprints of the characters are made. The rocking motion of the impression member is obtained by al-



ternately moving the ends of the same toward and away from the row of types after a frame carrying the impression member, has been rapidly moved to a position in which one end of the impression member abuts the sheet.

3,721,187

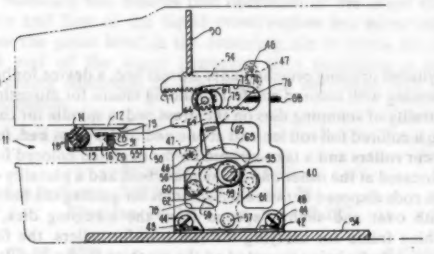
INKING DEVICE FOR A PLANAR PRINTING DIE PLATE

Leo Levinson, Berkeley, Calif., assignor to The Singer Company, New York, N.Y.

Filed April 22, 1971, Ser. No. 136,421

Int. Cl. B41f *1/46, 1/52*

U.S. Cl. 101—359 **12 Claims**



A reciprocable inking mechanism for applying ink to the printing surface of a printing die plate in a postage metering device. An ink impregnated roller is moved to and fro across the face of the die plate with each operation of the metering device. The inking roller moves in a linear path under control of a rotary drive mechanism.

3,721,188

PRINTING CYLINDER ASSEMBLY

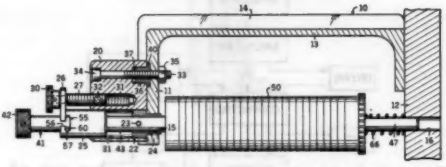
John C. Jacobsen, Town and Country, and John S. Wilson, Kirkwood, Mo., assignors to Allied Gear and Machine Co., Inc., St. Louis, Mo.

Filed Feb. 23, 1972, Ser. No. 228,689

Int. Cl. B41f *13/20, 13/44*

U.S. Cl. 101—375 **3 Claims**

A printing cylinder assembly including a shaft having longitudinally and axially spaced first and second shoulder portions with an intermediate shaft portion therebetween, the second shoulder portion being located nearer to the shaft end, and the first shoulder portion being provided with a cross-sectional dimension larger than that of the second shoulder portion and intermediate shaft portion, and the second shoulder portion being provided with a cross-sectional dimension larger than the shaft end. The printing cylinder is provided with a longitudinal passage therethrough that receives the shaft. First and second ball bearings are carried by opposite ends of the cylinder with their rotative axes in longitudinal alignment, the outer races of the ball bearings being fixed to the cylinder. The inner race of the first ball bearing is provided with a cross-sectional dimension larger than that of the inner race of the second ball bearing and only slightly smaller than that of the first shoulder portion. The inner race of the second ball bearing is provided with a cross-sectional dimension only slightly smaller than that of the second shoulder portion yet larger than that of the shaft end, whereby the inner race of the first ball bearing will pass over the shaft end, second shoulder portion and intermediate shaft por-



tion for a press-fit on the first shoulder portion. The inner race of the second ball bearing will pass over the shaft end for a press-fit on the second shoulder portion. The outer circumference of the cylinder is concentric with the longitudinally aligned rotative axes of the ball bearings to provide a precisely in-round cylinder diameter for accurate printing. The intermediate shaft portion has a cross-sectional dimension larger than the second shoulder portion to provide a stop abutment against which the inner race of the second ball bearing is positioned. The shaft has a portion adjacent to the first shoulder portion and on the opposite side of the first shoulder portion from the intermediate shaft portion to provide a stop abutment against which the inner race of the first ball bearing is positioned.

3,721,189

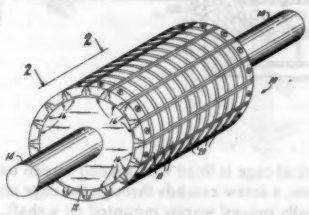
MAGNETIC PRINT CYLINDER

Andrew M. Bray, Little Suamico, Wis., assignor to Magna-Graphics Corp., Dayton, Ohio

Filed June 28, 1971, Ser. No. 157,183

Int. Cl. B41f *27/00*

U.S. Cl. 101—382 MV **6 Claims**



A magnetic print cylinder for use with flexible, magnetizable printing plates, the cylinder having a plurality of axially extending, magnetic assemblies mounted in a side-by-side relation on the surface thereof, each of the assemblies including a

channel member of magnetic flux insulating material, a plurality of permanent magnetic parts aligned in a spaced relation in the channel member, and a magnetizable pole piece positioned between each pair of magnets, the outer surface of the magnetic assemblies forming the plate mounting surface for the printing plates.

3,721,190

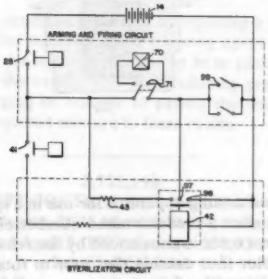
ANTIMINE PISTOL

Charles A. Lewis, Silver Spring, John Homza, Lanham, Eldon A. Volkmer, Takoma Park, and George P. Kalaf, Rockville, Md., Carl D. Coddington, Washington, D.C., and Charles J. Zablocki, Glendore, Calif., assignors to the United States of America as represented by the Secretary of the Navy

Filed June 7, 1961, Ser. No. 126,391

Int. Cl. F42b *21/34, 5/08*

U.S. Cl. 102—16 **21 Claims**



16. A pistol for initiating an underwater destructor charge comprising a casing, a hydrostatically electrical switch mounted in said casing and exposed to the exterior environment of said casing, a detonator mounted for rotation in said casing and moveable from a safe position to an armed position, a hydrostatically operated drive means mounted in said casing and exposed to the exterior environment thereof, linkage means connecting said hydrostatically operated drive means and said detonator for rotating said detonator from said safe position to said armed position a predetermined time period after said pistol reaches a predetermined depth of submergence, first electrical switch means mounted in said casing and closed by the rotation of said detonator from the safe position to the armed position, mechanical time delay means mounted in said casing and connected to said linkage means for actuation by said hydrostatically operated drive means, second electrical switch means integrally formed in said mechanical time delay means, said second electrical switch means closing a predetermined time after actuation of said mechanical time delay means, a battery, circuit means connecting said battery, said hydrostatically operated electrical switch, said first and said second electrical switch means and said detonator in electrical series circuit whereby when said second electrical switch means closes said detonator is initiated.

3,721,191

WELL SCREEN CLEANING DEVICE

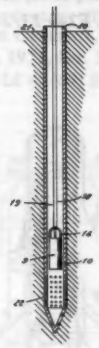
James E. L. Hastings, 2169 Vermont Avenue, Troy, Mich.

Filed Oct. 21, 1970, Ser. No. 82,586

Int. Cl. F42b *3/04*

U.S. Cl. 102—20 **2 Claims**

A well-screen cleaning device for unblocking clogged wells by blowing accumulated foreign material from the mesh of the well screen with rapidly expanding gasses without damaging the screen to provide screening for water after the cleaning operation and to obviate replacing the screen, comprising a case having an axial channel opening downwardly from the case and an explosive charge in the channel for producing the expanding gasses upon its detonation. Electric wires leading to the charge comprise both the lowering means for the device in



a well casing and the means for detonating the charge. A top vent aperture in the case emits a small volume of gas upwardly creating a resilient blocking turbulence in the casing above the main volume of expanding gasses to hold down the major volume of the expanding gasses for projection against the screen without damaging the screen.

3,721,192

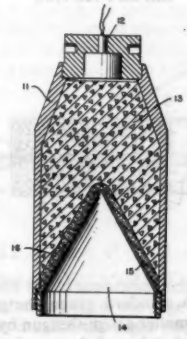
SHAPED CHARGE

William S. McEwan, and Herbert Dean Mallory, both of China Lake, Calif., assignors to The United States of America as represented by the Secretary of the Navy

Filed March 19, 1969, Ser. No. 808,706

Int. Cl. F42b *1/02*

U.S. Cl. 102—24 HC **2 Claims**



A shaped charge which has as an improvement a layer of fine quality explosive positioned between the normal bulk explosive charge and liner thereby providing a detonating front which exhibits a low degree of turbulence along the interior

wall of the metallic liner which makes a better shaped charge for use in precision metal deformation and other uses.

3,721,193

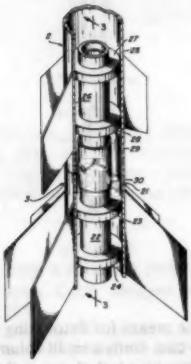
MULTI-STAGE MODEL ROCKET ASSEMBLY

Leroy E. Piester and Robert E. Royal, Phoenix, Ariz., assignors to Centuri Engineering Company, Inc.

Filed Mar. 25, 1970, Ser. No. 22,617

Int. Cl. F24b *13/28, 15/14*

U.S. Cl. 102—34.5 **1 Claim**



Reliable sequential ignition of successive engines in a multi-stage model rocket is achieved by releasably positioning successive engines in end-to-end relationship and by coupling either the engines or tubular shells containing the engines with a coupler ring having holes sized to vent the pressure front formed when the preceding engine burns to its leading end to delay separation of the engines until the next engine ignites at its discharge end.

3,721,194

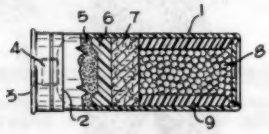
DIVERSIFYING THE SHOOTING CHARACTERISTICS OF SHOTGUNS

Charles N. Weston, Jr., 105 Ruth Drive, Florissant, Mo.

Filed April 13, 1970, Ser. No. 27,708

Int. Cl. F42b *7/08*

U.S. Cl. 102—42 C **13 Claims**



Simulating, with a standard gauge shotgun, the shooting characteristics of a smaller gauge shotgun by using a shotshell whose case fits the chamber of the standard gauge gun, but whose propellant charge, shot charge, priming and confinement are coordinated to produce ballistic results resembling those of the smaller gauge gun, and the shot charge is circumferentially surrounded by a bushing whose outside diameter corresponds with the standard gauge, and whose inside diameter corresponds with the smaller gauge.

3,721,195

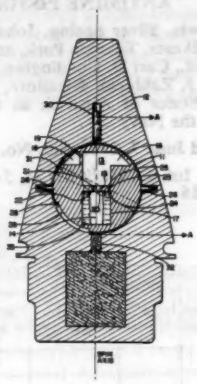
LIQUID REVOLUTION COUNTER FOR FUZE ARMING

Werner Hans Egli, and Asbjorn M. Severson, both of Minneapolis, Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed June 1, 1971, Ser. No. 148,460

Int. Cl. F42c *15/26*

U.S. Cl. 102—79 **1 Claim**



A safing and arming apparatus for use in a spinning projectile in which after a predetermined number of revolutions of the projectile a rotor is unbalanced by the relocation of liquid within the rotor thus causing the rotor to rotate and bring a detonator in line with a firing train.

3,721,196

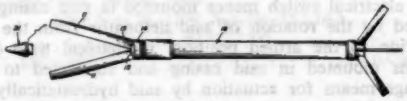
CHAFF DISPENSING SYSTEM

Edward O. Willis, Copley; Lester W. Musser, Jr., Barberton, and James E. Seagraves, Uniontown, all of Ohio, assignors to The United States of America as represented by the Secretary of the Navy

Filed July 30, 1970, Ser. No. 64,916

Int. Cl. F42b *13/42*

U.S. Cl. 102—89 **2 Claims**



A method and apparatus for dispensing chaff from a rocket delivered warhead. A chaff head is explosively opened a predetermined time after the rocket is fired. This exposes the chaff to the air which quickly disperses it into a cloud.

3,721,197

INJECTION-EXPANSION MOLDED SHOTSHELL WAD AND METHOD OF FORMING THE SAME

John H. Hughes, St. Louis, Mo., and Daniel F. Duryea, Madison, Ill., assignors to Olin Corporation

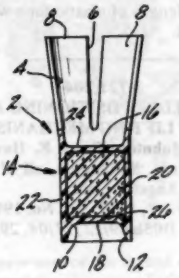
Filed Dec. 4, 1970, Ser. No. 95,073

Int. Cl. F42b *7/08*

U.S. Cl. 102—95 **10 Claims**

A one-piece plastic wad structure for use with a shotshell, the wad structure having a projectile-receiving pocket, an obturating pocket, and a transverse wall integral with the

pockets and separating one pocket from the other. The projectile pocket and obturating pocket have side walls of solid plastic, and at least a portion of the transverse wall is foamed plastic. The transverse wall is of substantial thickness so as to cushion the shot charge when a cartridge containing the wad is



fired. The wad structure is formed by injecting a molten mixture of a resinous material and a foaming agent into a mold cavity, cooling the injected mixture so as to partially solidify the mixture in the cavity, and then reducing pressure in the cavity by enlarging its volume to permit the transverse wall portion of the injected mixture to foam in situ.

3,721,198

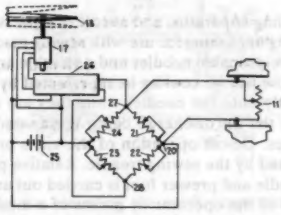
LIFT CONTROL FOR RAIL CAR

Lindsay M. Applegate, 7045 Molokai Drive, Paradise, Calif.

Filed April 5, 1971, Ser. No. 130,926

Int. Cl. B64f *3/00*

U.S. Cl. 104—23 R **7 Claims**



Method and means for controlling an air foil for regulating the weight carried by slippers supporting a rail car at high speeds travelling on conventional rails.

3,721,199

ARTICULATED CONTAINER CAR

Robert L. Hassenauer, Wilmette, Ill., assignor to Amsted Industries Incorporated, Chicago, Ill.

Filed Nov. 16, 1970, Ser. No. 89,614

Int. Cl. B65j *1/24*; B60p *7/16*; B61d *45/00*

U.S. Cl. 105—366 A **8 Claims**

The articulated car includes three car components connected by semi-permanent connections supported on railway trucks. Each component includes a center frame resiliently longitudinally supported between the side sills. The containers are supported upon bolsters that rest on the side sills and are resiliently connected to the center frame. A side bearing arrangement between adjacent units includes opposed overlapping members. The resilient structure allows a container to span over an articulated connection.

3,721,200

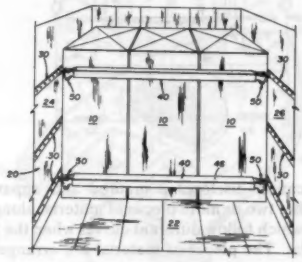
FREIGHT RESTRAINING BAR

Dana M. Schmidt, Barrington, Ill., assignor to United States Gypsum Company, Chicago, Ill.

Filed Apr. 2, 1971, Ser. No. 130,675

Int. Cl. B61d *45/00*; B60p *7/16*

U.S. Cl. 105—369 B **25 Claims**



A freight-restraining bar and head wherein a single rail-engaging member is used to connect the head with two different, alternatively used, securing means in the freight chamber. The rail-engaging member is pivoted to rotate between the two positions it must take to penetrate the two differentially oriented securing means. Locking provisions are provided to prevent accidental dislodging of the heads, once engaged.

3,721,201

BOMB RECOVERY AND SHIELD APPARATUS

William A. Boller, 2700 Del Medio Ct., No. 115, Mountain View, Calif.

Filed Sept. 30, 1971, Ser. No. 185,301

Int. Cl. E06b *9/00*

U.S. Cl. 109—49.5 **16 Claims**

Bomb recovery and shield apparatus includes a cage shaped to slip over a bomb, and a clip in the cage adapted to engage the bomb and retain it inside the cage. The apparatus also includes and explosion-resistant tubular shell having an upwardly opening end and a post extending above the open end. The post supports a pulley, and a line reeved over the pulley is secured to the cage. A workman standing a safe distance from the bomb pulls the line to slip the cage over the bomb and thereafter guide the bomb into the shell. A remote-controlled lid with an open mesh screen can be closed over the open end of the shell after the bomb is safely inside.

3,721,202

METHOD OF, AND APPARATUS FOR, STITCHING TOGETHER TWO LAYERS OF MATERIAL

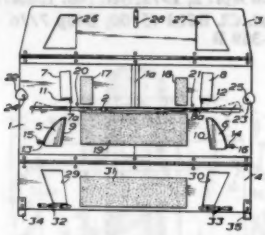
Alfred Manston Heeley Dodsworth, Guiseley, England, assignor to W. J. Clarkson Limited, Leeds, England

Filed June 11, 1971, Ser. No. 152,178

Claims priority, application Great Britain, June 19, 1970, 29,797/70; March 29, 1971, 8,075/71

Int. Cl. D05b *21/00*

U.S. Cl. 112—121.15 **21 Claims**



The specification discloses a method and apparatus for stitching together two or more pieces of material along desired stitching lines which follow different curves when the pieces of material are flat. The pieces of material are arranged over a base plate having a guide slot corresponding in contour to the required stitching line and one or more of said pieces of material is distorted out of its own plane in such a way that the stitching lines in all the pieces of material are located in substantially congruent relationship overlying said guide slot. The distorting means may be a plate hinged between the base plate and an upper plate and having an upward projection receivable in an opening in the upper plate. Alternatively the distorting means may be projections upstanding from said base plate and receivable in openings in one or more upper plates hinged to the base plate. The apparatus causing the required distortion is conveniently designed for use with a sewing machine so that it may be guided beneath the needle of the sewing machine by the guide slot and the pieces of material thus stitched together.

3,721,203

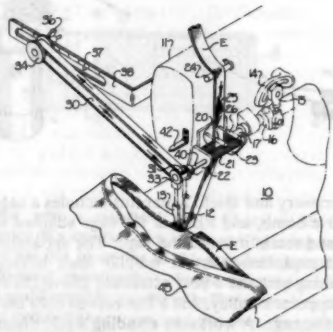
APPARATUS FOR MEASURING ELASTIC FED TO A SEWING MACHINE

McCona L. George, Sweetwater, Tenn., assignor to Charles H. Bacon Company, a division of Genesco, Inc., Lenoir City, Tenn.

Filed Sept. 17, 1971, Ser. No. 181,361

Int. Cl. D05b *21/00*

U.S. Cl. 112—121.26 **5 Claims**



This apparatus permits the operator of a sewing machine to accurately determine the length of elastic tape which is attached to a garment, such as the elastic waist band of panty hose and the like. The apparatus includes an endless flexible band supported adjacent the sewing machine head and in clear view of the sewing machine operator. An indicating mark is provided on the band so that the operator can determine when one revolution of the band has been completed. The elastic band is driven in timed relation to the elastic tape fed device on the sewing machine so that its movement constantly indicates the length of elastic tape which has been attached to the garment.

3,721,204

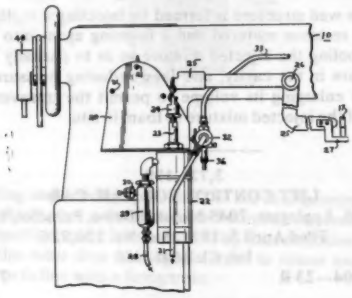
AUTOMATIC NEEDLE POSITIONING AND PRESSER FOOT LIFTING MECHANISM

Philip O. Schaffer, Mohnton; Bryce E. Hoverter, Reinholds, and Kenneth C. Haas, Shillington, all of Pa., assignors to Teledyne, Inc., Los Angeles, Calif.

Filed Nov. 17, 1971, Ser. No. 199,555

Int. Cl. D05b *69/22, 71/04, 29/02*

U.S. Cl. 112—218 R **11 Claims**



Needle cooling apparatus, and needle and presser foot position controlling apparatus for use with sewing machines of the type having reciprocable needles and a raisable and lowerable presser foot, the needle cooling being effected by discharging cool air directly onto the needles while they are carrying out stitching with the air discharge being terminated as soon as stitching ceases. On-off operation of the air is provided by a control operated by the sewing treadle. Relative position control of the needle and presser foot is carried out automatically under control of the operator by means of a mode control, a needle positioner mechanism, a presser foot actuating device and a second control operated by the sewing treadle when the latter is heeled. During stitching the presser foot is always down, and when stitching is terminated, the needle is always down while the presser foot may remain down or move up as determined by the position of the mode control. Heeling of the treadle causes the needle to rise and causes the presser foot to rise if it were down, but if the presser foot had been up it is caused to descend until the needle rises and to thereafter rise. Release of the treadle from its heeled position causes the presser foot to descend.

3,721,205

TENSION DEVICE FOR A SEWING MACHINE

Takeshi Ono, Nagoya; Takashi Hirayama, Toyota, and Kimihiko Yamamoto, Nagoya, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Aichi Pref., Japan

Filed Feb. 3, 1971, Ser. No. 112,203

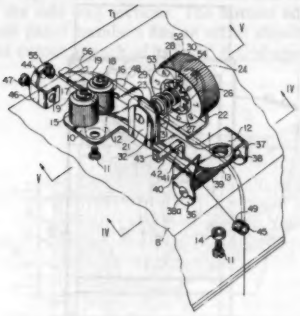
Claims priority, application Japan, Feb. 9, 1970, 45/11245

Int. Cl. D05b *47/00*

U.S. Cl. 112—254 **3 Claims**

A tension device adapted for the sewing machine including an assembly consisting of two nip forming members at least one of which rotates freely on its stud. An adjusting means is provided to tighten or loosen spring means by means of which

the two nip forming members are always passed against one another. The tension is applied to the thread by a friction force produced by the rotation of the roll or rolls on their



studs, whereby uneveness of the thread does not cause breaking of the thread and the skipping of stitches when the thread passes the nip.

3,721,206

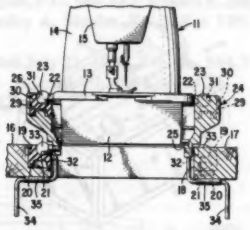
SEWING MACHINE AND AN ADAPTER FOR CHANGING THE ELEVATION THEREOF

Heinrich Ciecior, D-7505 Ettlingen, and Peter Herbold, D-752 Bruchsal, both of Germany, assignors to The Singer Company, New York, N.Y.

Filed Oct. 8, 1971, Ser. No. 187,711

Int. Cl. D05b *75/00*

U.S. Cl. 112—258 **1 Claim**



An adapter for elevating the work supporting surface of a sewing machine above the level of a machine supporting table top in which the adapter is formed with mounting means complemental to the regular mounting facilities on the machine supporting table top and on the sewing machine so that the adapter may be positioned in place without the use of tools.

3,721,207

COLLECTION AND DISPOSAL OF SHIP'S SEWAGE

Charles W. Walker, Tustin, Calif., assignor to the United States of America as represented by the Secretary of the Navy

Filed April 15, 1971, Ser. No. 134,284

Int. Cl. B63b *35/00*

U.S. Cl. 114—0.5 R **3 Claims**

A system for collecting waste discharge by gravity into float supported pipes. The pipes terminate into a submerged sewage holding and pumping station. From there it is pumped into existing sanitary sewer lines on shore.

3,721,208

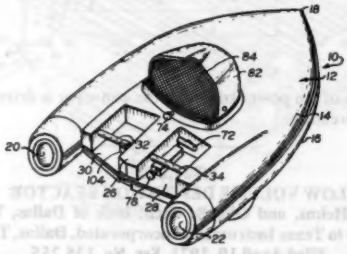
VEHICLE AND APPARATUS FOR MOVING THE VEHICLE THROUGH A FLUID

Laurence L. Lampert, and Arthur B. Joyal, both of New York, N.Y., assignors to Minijet Sportscrafts Inc., New York, N.Y.

Filed Aug. 20, 1971, Ser. No. 173,450

Int. Cl. A63c *11/10*

U.S. Cl. 115—6.1 **21 Claims**



The vehicle comprises a buoyant body and moving means within the body for moving the body through a fluid. The moving means includes a chamber having an intake port and an outlet port, and propelling means in the chamber for drawing the fluid into the chamber through the intake port and for propelling the fluid out of the chamber through the outlet port to propel the vehicle. A motor is provided for operating the vehicle. An air inlet passage communicates with the chamber adjacent the upstream end of the propelling means and closure means is provided which is selectively operable to open and close the air inlet passage to prevent the propelling means from drawing fluid into the chamber through the intake port when the closure means is in the open position.

3,721,209

DEVELOPING UNIT FOR ELECTROSTATIC COPYING APPARATUS

Roland Szostak, Grunwald; Karl Hartwig, Unterhaching; Gunter Maurischat; Gunter Schnall, both of Munich, and Jurgen Vossnacke, Pullach, all of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Oct. 7, 1971, Ser. No. 187,405

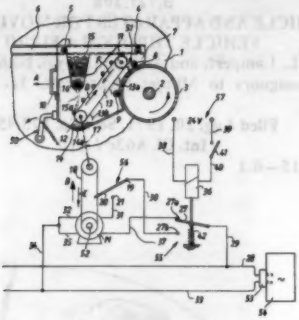
Claims priority, application Germany, Oct. 9, 1970, P 20 49 650.8

Int. Cl. B05c *11/00*; G03g *13/00*

U.S. Cl. 118—2 **11 Claims**

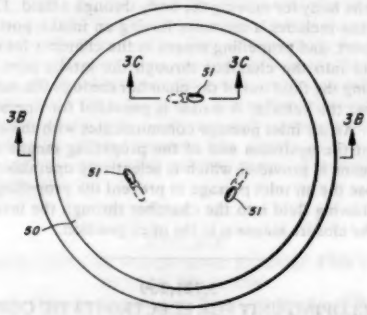
An electrostatic copying apparatus wherein a driven xerographic surface which carries electrostatic latent images receives developer material from the buckets of a conveyor which is normally driven in a first direction but can be driven in a second direction to thereby retract the foremost filled bucket away from a dumping position. The conveyor is driven by a reversible electric motor which is automatically started in reverse in response to deenergization of a relay and is automatically arrested after a predetermined interval of operation in reverse to thus insure that the contents of filled buckets on the conveyor are unlikely to spill into the copying apparatus when a carriage which supports the conveyor and a magazine for developer material is moved to and from a retracted position. The circuit of the motor is opened by a switch which is held in closed position by a power train between the conveyor

and the motor when the conveyor is driven in the first direction. The switch is caused to open in response to such



operation of the power train that the conveyor is driven in the second direction.

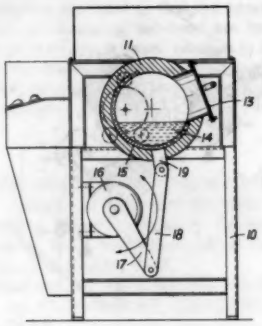
3,721,210
LOW VOLUME DEPOSITION REACTOR
John D. Helms, and Olin B. Cecil, both of Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.
Filed April 19, 1971, Ser. No. 135,255
Int. Cl. C23c *13/08*
U.S. Cl. 118—48 **8 Claims**



A reactor system for sequentially forming layers on substrates, by either reacting a gas with a surface of a substrate or by selective precipitation of constituents of a gas on a surface of a substrate, is disclosed. The uniformity of the layer is increased by rotating the substrate as the gas is passed over the surface of the substrate. Improved substrate temperature control is provided by optical heaters. Each reactor chamber has a low volume, thereby reducing the contamination problems associated with loading and unloading the reactor. Automatic load/unload apparatus is provided, permitting the reactor to be loaded and unloaded without a clean-up cycle.

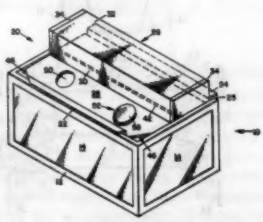
3,721,211
APPARATUS FOR TINNING OF METAL WIRE
Siegfried Stoiber, A-4020 Linz, Austria, assignor to Firma Gebauer & Griller, Vienna, Austria
Filed Dec. 3, 1970, Ser. No. 94,904
Int. Cl. B05c *3/12*
U.S. Cl. 118—405 **1 Claim**

Apparatus for tinning of metal wire, particularly copper wire, at a high running speed. The apparatus has a trough filled with a tin bath and is provided on two oppositely positioned side surfaces with openings which are arranged coaxially to one another and through which the wire is guided into or out of the bath. The axis of said openings is eccentric with



respect to the central axis of the trough and means pivot said trough about the axis of the openings to selectively effect immersion, or removal therefrom, of the wire.

3,721,212
AQUARIUM COVER
Daniel F. Groth, 14 Brookdale Drive, Wilbraham, Mass.
Filed July 28, 1971, Ser. No. 166,760
Int. Cl. A01k *64/00*
U.S. Cl. 119—5 **5 Claims**

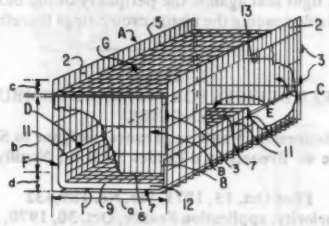


The combination with an open topped aquarium of a cover formed with stepped flanges for resting on the ends of the aquarium walls and having an integral upstanding housing for a light source, an opening in the cover below the light source and a clear, transparent plate for closing off the opening, the plate permitting the passage of light to the interior of the aquarium but serving as a barrier to contaminants dropping into the aquarium, the cover having feeding openings therein and feeding units for optional use in the feeding openings and extending into the aquarium.

3,721,213
ANIMAL REARING CAGES
Frans Bruggeman, Zulzeke, Belgium, assignor to N. U. Bekaert S.A., Zwevegem, Belgium
Filed July 30, 1971, Ser. No. 167,577
Claims priority, application France, Aug. 7, 1970, 7029271
Int. Cl. A01k *31/06*
U.S. Cl. 119—17 **10 Claims**

A cage useful for rearing animals that is constructed of a number of wire mesh panel members includes a U-shaped panel member having a central panel section and two contiguous side wall sections, two end wall panel members releasably connected to the side wall sections and having their bottom edges spaced above the level of the central panel sec-

tion and their top edges spaced below the level of the top edges of the side wall sections and a floor panel member disposed above the central panel section at the same level as the bottom edges of the side wall sections and releasably connected to the side wall sections. The bottom edge of each of the end wall panel members has an offset shoulder defining a rectangular cutout at each of its ends. A U-shaped tray may be



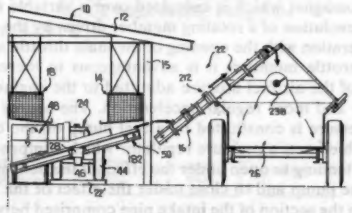
inserted into and withdrawn from the U-shaped space defined generally by the space between the U-shaped panel member, the floor panel member, and the bottom edges of the end wall panel members. A roof panel member may be disposed at the same level as the top edges of the end wall panels. A battery of rearing cages may be formed by an arrangement in which a number of the cages are stacked and/or juxtaposed together.

3,721,214

REMOVAL AND DISPOSAL OF MANURE FROM SUSPENDED CAGE CHICKEN HOUSES

William R. Staples, P.O. Box 147; Russell E. Staples, Rt. 3, Box 576, and Wesley A. Staples, Rt. 3, Box 189, all of Palatka, Fla.

Filed July 21, 1971, Ser. No. 164,743
Int. Cl. A01k *31/04*
U.S. Cl. 119—22 **3 Claims**



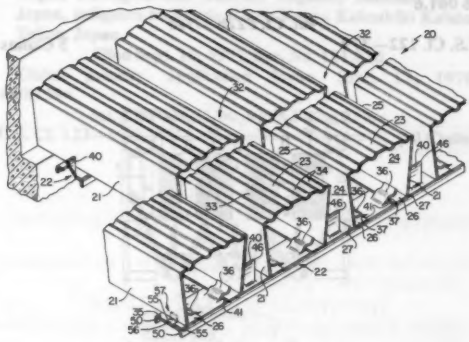
A self-powered pitcher unit has an adjustably inclined pick up conveyor that picks up manure disposed in piles on the ground below the suspended cages of the middle rows in a chicken house, as the pitcher unit is pulled down the aisles between the outer and middle rows of cages by a small tractor, and transports the manure to a cross thrower conveyor operating from a hopper at the upper outlet end of the pick up conveyor with the manure being thrown out the open sides of the chicken house by the upwardly and outwardly inclined thrower conveyor onto a loader unit that is pulled along the outside of the house by a farm tractor in synchronized travel with the pitcher unit. The loader unit, which is mounted on a manure spreader and is driven by the power take-off on the tractor, has an inclined foldable platform onto which the manure is thrown and a conveyor carries the manure up the platform and drops it on an auger in advance of the spreader. Initially, the pitcher unit functions alone with a deflector hood on the thrower conveyor to transfer manure piles from under the outer rows to the middle rows of cages.

3,721,215

CONNECTOR-SPACER AND FLOOR CONSTRUCTION USING SAME

Donald E. Vickstrom, and George F. Swenck, both of Richmond, Va., assignors to Reynolds Metals Company, Richmond, Va.

Filed Aug. 13, 1971, Ser. No. 171,529
Int. Cl. A01k *1/00*
U.S. Cl. 119—28 **16 Claims**



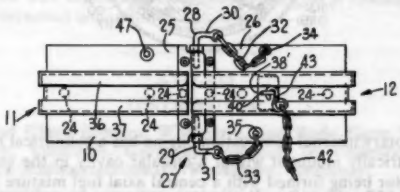
An improved connector-spacer for holding together in spaced parallel relation a plurality of floor-forming channel members which have substantially vertically arranged side walls terminating in bottom fastening flanges and a floor construction using such connector-spacer are provided. The connector-spacer has a plurality of upwardly and laterally extending fastening legs each defining a recess which is adapted to receive an associated fastening flange therewithin and each channel member is made of a resilient material which provides a normal resiliency therefor and holds its fastening flanges within associated recesses and in grasping contact against such fastening legs. The connector-spacer has integral means retaining an associated fastening flange of a channel member within an associated recess to assure each member is held firmly in position even after extended use.

3,721,216

BELT OR COLLAR WITH RUNNER TRACK

Joan M. Lippe, 303 West Price Street, Linden, N.J.; Irving Goldfarb, 8101 Glenwood Road, Brooklyn, N.Y., and Harry Jablon, 602 Birchwood Road, Linden, N.J.

Continuation-in-part of Ser. No. 832,400, June 11, 1969, abandoned. This application April 13, 1970, Ser. No. 27,486
Int. Cl. A01k *27/00*
U.S. Cl. 119—106 **8 Claims**



In a belt-type toy or collar, adapted to encompass a wearer, the belt has a circumferential track at its outer side which retains a slide member therein adapted to be connected to a ball or other object by an elongated flexible connecting member, the slide member is adapted to move in the track to permit relative circumferential movement of the object with respect to the wearer and the belt may include a chordally ex-

tending elastic member fixed at each end to an interior portion of the belt to accommodate various sized wearers.

3,721,217

WASTE HEAT BOILER FOR HEAT FURNACES

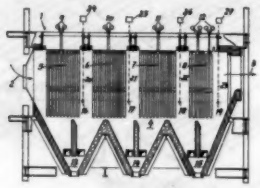
Rudolf Willach, Oberhausen, and Aruth Rafael, Wesel, both of Germany, assignors to Deutsche Babcock & Wilcox Aktiengesellschaft, Oberhausen, Rhineland, Germany

Filed July 13, 1971, Ser. No. 163,538

Claims priority, application Germany, July 21, 1970, P 20 36 061.6

Int. Cl. F22b *37/48*

U.S. Cl. 122—379 **5 Claims**



A heat waste boiler having a waste gas duct in which two bundles of coiled pipes are mounted. The pipes are provided with vibrators for removing collected dust particles from the pipes, and thermostatic elements for measuring the temperature behind each cluster of pipes. The vibrators are independently controlled to remove the dust particles collected on the pipes.

3,721,218

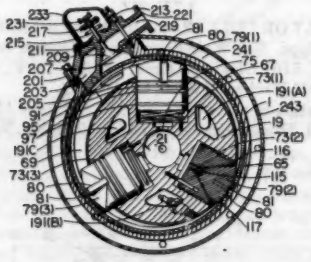
ROTARY INTERNAL COMBUSTION ENGINE

Victor G. Null, 19 Kingsway Drive, Wentzville, Mo.

Filed Nov. 18, 1970, Ser. No. 90,750

Int. Cl. F02b *53/06*, *53/10*

U.S. Cl. 123—8.13 **30 Claims**



A rotary internal combustion engine has a cylindrical rotor eccentrically mounted within a circular cavity in the stator, the rotor being formed with a central axial fuel mixture inlet passageway and with a plurality of radial cavities in which are slidably mounted piston vanes, the crowns of which protrude from the rotor and are biased into closely spaced relation with the periphery of the block cavity to form therewith sealed compression-combustion chambers in the crescent-shaped spaces between the rotor and periphery of the block cavity. Sealing elements closely spaced from the block cavity periphery bisect the piston vane crowns in planes coincident with the rotor axis and each piston vane is formed with a pair of intake valves disposed respectively fore and aft of the sealing elements and sequentially operable to pass fuel mixture from the central inlet passageway into the combustion chambers defined within the crescent-shaped spaces by a pair of adjacent pistons and thereby materially increase the volumetric efficiency of the engine as compared with engines of the prior art having only a single inlet valve per combustion chamber. In one embodiment, wiper bars engageable with the block cavity surface are resiliently mounted in the piston crown so as to maintain a tight seal against the periphery of the block cavity while yieldably spacing the piston crown rings therefrom.

3,721,219

FUEL FEED DEVICES FOR INTERNAL COMBUSTION ENGINES

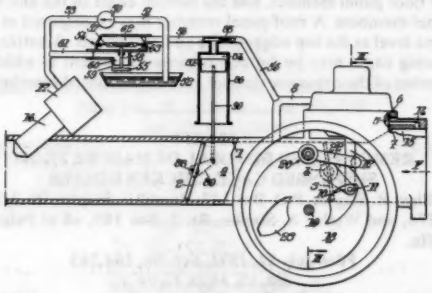
Francois Mennesson, Nanterre, France, assignor to Societe Industrielle de Breuets et d'Etudes S.I.B.E., Neuilly S/Seine, France

Filed Oct. 15, 1971, Ser. No. 189,532

Claims priority, application France, Oct. 30, 1970, 39332

Int. Cl. F02b *3/10*; F02m *51/02*

U.S. Cl. 123—32 EA **2 Claims**



The fuel feed device includes an injection valve actuated by an electromagnet which is energized over a variable fraction of each revolution of a rotating member driven by the engine. On acceleration with the opening of the main throttle member of two throttle members it is advantageous to increase the richness of the air/fuel mixture admitted to the engine to obtain freer and more regular acceleration. The source of fuel under pressure is constituted by a fuel pump on the delivery pipe of which acts a pressure regulator which comprises a relief valve tending to open under the effect of the delivery pressure of the pump and to close under the effect of the suction existing in the section of the intake pipe comprised between its two throttle members. The suction is transmitted by a linking channel to a diaphragm to which the relief valve is coupled. The variable volume chamber is connected to the linking channel between a calibrated orifice and the diaphragm of the pressure regulator and is controlled by means adapted to increase its volume on opening of the main throttle member.

3,721,220

VARIATOR FOR THE SETTING OF THE CAMSHAFTS OF AN INTERNAL COMBUSTION ENGINE

Giampaolo Garcea, Milan, Italy, assignor to Alfa Romeo S.p.A., Milan, Italy

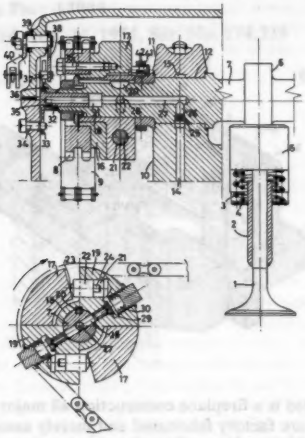
Filed July 9, 1970, Ser. No. 53,381

Int. Cl. F01l *1/34*

U.S. Cl. 123—90.15 **4 Claims**

The advance or delay of opening of the intake and/or exhaust valve in an internal combustion engine is obtained

with the device disclosed herein as a function of the power instantaneously delivered by the engine. The indicating parameters can be the degree of opening of the throttle(s), the number of revolutions per minute of the crankshaft



and the feeding pressure of the engine. A pressure-sensitive device exploits the pressure of the lubricant (oil) for effecting the phase adjustment of the camshaft.

3,721,221

INTERNAL COMBUSTION ENGINE EXHAUST GAS CONTROLLING DEVICE

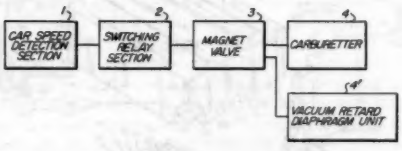
Masashi Okada, Kariya, Japan, assignor to Nippondenso Kabushiki Kaisha, Aichi-Ken, Japan

Filed Feb. 27, 1970, Ser. No. 14,968

Claims priority, application Japan, April 9, 1969, 44/32342

Int. Cl. F02d *31/00*; **F02p** *5/04*

U.S. Cl. 123—97 B **1 Claim**



An internal combustion engine exhaust gas controlling device which operates a solenoid valve in response to a predetermined value of the car speed driven by the engine, said solenoid valve being operative to communicate a throttle valve mechanism of a carburetor of said engine to an atmospheric pressure circuit and simultaneously a vacuum retard diaphragm unit for a distributor with a vacuum circuit conducted to a suction manifold of said engine when the vehicle speed exceeds a predetermined value, whereby the vacuum produced at deceleration of the vehicle is utilized to automatically operate the distributor vacuum retard diaphragm to retard spark timing and the atmospheric pressure communicated to the throttle valve mechanism operates to prevent the throttle value from complete closure in case the vehicle is decelerated from the speed above said predetermined value thereby to greatly reduce the exhaust of noxious gas from the internal combustion engine.

3,721,222

CONTROL APPARATUS FOR THE IDLE POSITION OF A THROTTLE VALVE FOR AN INTERNAL COMBUSTION ENGINE

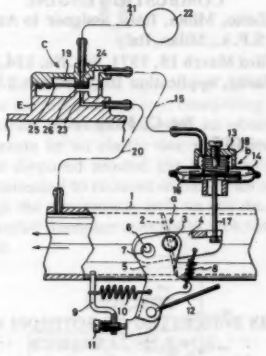
Toshio Shioya, Omiya; Akitoshi Nakamura, Tokyo; Akio Nagai, Kawagoe, and Takeshi Noguchi, Saitama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 16, 1971, Ser. No. 181,010

Claims priority, application Japan, Sept. 17, 1970, 45/81394

Int. Cl. F02d *33/00, 9/00*; **F02m** *23/04*

U.S. Cl. 123—97 B **10 Claims**



Apparatus for automatic control of the throttle valve of an internal combustion engine comprises an adjusting mechanism for the throttle valve idle position operated by the negative pressure in an air inlet pipe via a negative pressure operated mechanism so that the idling position of the throttle valve can be adjusted. A temperature sensitive valve apparatus is operated by engine temperature and is interposed in a communicating passage between the inlet pipe and the negative pressure operated apparatus. The valve apparatus is so constructed that the negative pressure operated apparatus is brought into its operating condition by being in communication with the inlet pipe when the engine temperature is low, but is brought into inoperative condition by being in communication with the ambient air when the engine is heated to a predetermined temperature.

3,721,223

DISTRIBUTOR

Helmut Klaus Randau, Wolfsburg, and Bodo Egon Taphorn, Vorsfelde, Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

Continuation of abandoned application Ser. No. 836,229, June 25, 1969. This application May 18, 1971, Ser. No. 144,626

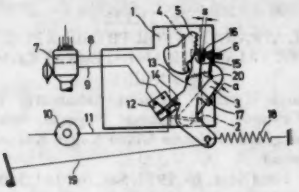
Claims priority, application Germany, June 28, 1968, P 17 51 612.0

Int. Cl. F02d *11/10*

U.S. Cl. 123—102 **6 Claims**

Device to determine the current path in an ignition

distributor for motor vehicle engines having a switch operated by a throttle valve linkage and a circuit breaker system controlled by the switch and provided with an intermediate lever to change the switch.



3,721,224

IGNITION CIRCUIT FOR SPARK PLUGS OF INTERNAL-COMBUSTION ENGINE

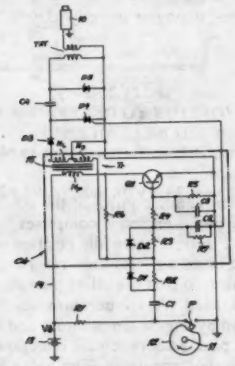
Giorgio Del Zotto, Milan, Italy, assignor to Ates Componenti Elettronici S.P.A., Milan, Italy

Filed March 15, 1971, Ser. No. 124,173

Claims priority, application Italy, March 13, 1970, 21916 A/70

Int. Cl. F02p *3/06*

U.S. Cl. 123—148 E 10 Claims



The ignition circuit of a spark plug of an internal-combustion engine includes a storage condenser in series with a controlled rectifier which is periodically triggered under the control of an engine-driven cam switch by a blocking oscillator comprising a transistor with grounded emitter in series with the primary of a coupling transformer. One secondary winding of that transformer is inserted, together with a pair of diodes, in a charging path for the storage condenser while another secondary winding lies between the emitter of the transistor and its base which is connected through a feedback resistor to the collector thereof and via an R/C network to the gate of the controlled rectifier. During the open phase of the cam-switch cycle, the base is grounded through the last-mentioned secondary winding which is so poled as to intensify a firing pulse capacitively transmitted to the base upon the opening of the switch; at the same time the controlled retifier is turned on to discharge the previously charged storage condenser through the ignition circuit, whereupon the transistor cuts off and the condenser is recharged by the reversed transformer voltage.

3,721,225

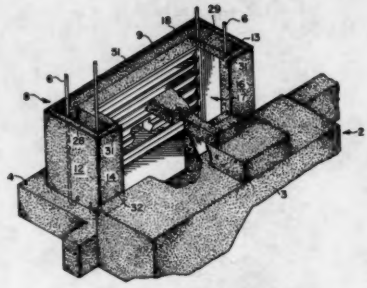
FACTORY FABRICATED FIREPLACE CONSTRUCTION

Joe Dean Tidwell, 3404 Polaris Street, Modesto, Calif.

Filed Dec. 6, 1971, Ser. No. 204,927

Int. Cl. F24b *1/18*

U.S. Cl. 126—120 11 Claims



Presented is a fireplace construction all major components of which are factory fabricated and merely assembled at the job site. The fireplace construction incorporates apparatus for adjusting the height of the hearth dependent upon conditions at the site such as grade, height, and level.

3,721,226

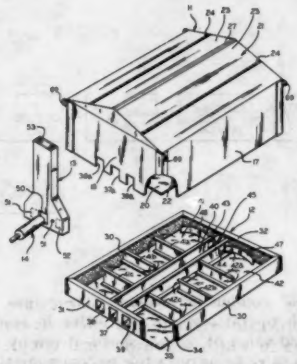
HOT BOX FOR ASPHALT

Herman T. Childree, Tyler, and Stewart T. Trawick, Dallas, both of Tex., assignors to Sabine Manufacturing Inc., Dallas, and Howe-Baker Engineers, Tyler, both of Tex., part interest to each

Filed Aug. 30, 1971, Ser. No. 176,108

Int. Cl. E01c *19/45*

U.S. Cl. 126—343.5 A 9 Claims



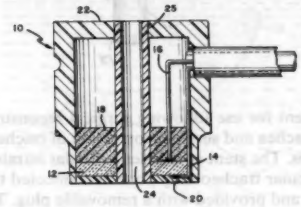
A hot box for maintaining asphalt at elevated temperatures including a closed and insulated container, a service apron, a heat exchanger for heating the container, a burner capable of producing high velocity hot gases for driving a mixture of hot gases and air through the heat exchanger and a temperature control system.

3,721,227

TRANSDUCER FOR PULSE-ECHO ULTRASONIC EXPLORATION

Eugene A. Larson, P.O. Box 552, Lewistown, Pa. 17044; Le Roy A. Kopel, 20 E. Market St., McVeytown, Pa. 17051; and Daniel E. McNulty, R.D. 4, Box 75B, Lewistown, Pa. 17044

Filed Aug. 24, 1971, Ser. No. 174,319
Int. Cl. A61b 5/00
U.S. Cl. 128—2 V 9 Claims



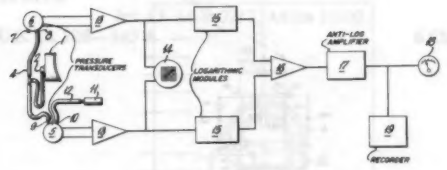
A transducer for pulse-echo ultrasonic exploration is provided with a substantially centrally disposed aperture through which a surgical instrument is passed. The transducer aids in locating the surgical instrument accurately within an opaque body and monitoring the progress of the particular procedure.

3,721,228

DEVICE FOR THE EVALUATION OF DECONGESTANT DRUGS

Fred Robert Prediger, Westfield, and Michael Kniazuk, Mountainside, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed May 14, 1971, Ser. No. 143,512
Int. Cl. A61b 5/00
U.S. Cl. 128—2 R 3 Claims



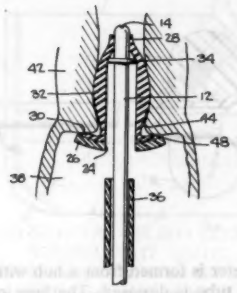
Device for measuring pharyngeal pressure and nasal airflow in order to evaluate the effectiveness of decongestant drugs in which a conventional circular orifice is inserted into a face mask. As a patient breathes through this orifice, with accompanying pharyngeal tube passing between his lips, the pressure-flow relationships between the nose and mask orifice are continuously compared by a specifically designed analog computer. For simplicity of clinical work, the recorded comparison signal can represent a percentage of, or an area relative to, that of the standard mask orifice. For precise calculations, the answer may be converted to absolute units of flow (liters/sec.) and pressure (cm. H_2O) after absolute calibration of the particular face mask orifice employed.

3,721,229

OBTURATOR DEVICE FOR HYSTEROSALPINGOGRAPHY AND THE LIKE

Norman Panzer, 71 Blanchard Road, South Orange, N.J.

Filed April 6, 1972, Ser. No. 241,770
Int. Cl. A61b 19/00; A61m 3/00
U.S. Cl. 128—2 A 11 Claims



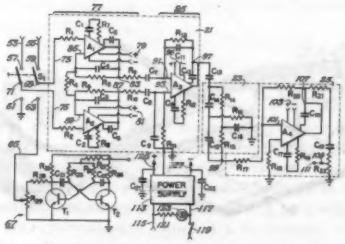
An obturator device for the injection of fluid into a body cavity through a narrow passageway, comprising an injection tube reciprocatively moveable through an obturating collar and secured thereto by an elastic sleeve of intermediate enlarged diameter disposed around the tube, with the sleeve adapted to be distended to reduced diameter for movement of the tube through the passageway and, on release, to return to its natural expanded diameter thereby to lock the tube to the passageway wall.

3,721,230

HIGH-GAIN MONITOR TO DETERMINE ELECTRO-CEREBRAL SILENCE

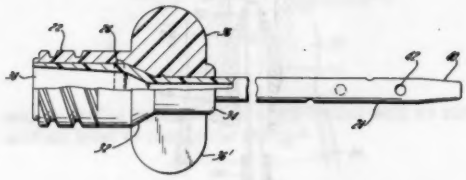
Robert S. Ziernicki, Dallas, Tex., assignor to Marvin C. Overton III, Fort Worth, Tex.

Filed Nov. 23, 1970, Ser. No. 91,629
Int. Cl. A61b 5/00
U.S. Cl. 128—2.1 B 19 Claims



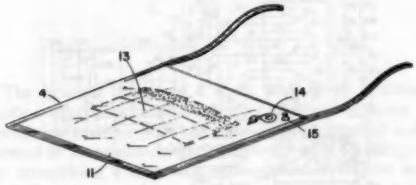
An apparatus for measuring physiological conditions of human and animal bodies characterized by; in addition to a preamplifier, filter, amplifier, recorder, and power supply; a common mode noise rejection circuit and a shield for the noise-sensitive components; whereby the apparatus may be employed at a patient's location, even in the presence of electrical noise. The apparatus is characterized by other improved concepts that are also disclosed; such as, front end loading of paper for the recorder; a channel selector for selecting the electrodes to be monitored; a small portable unit that includes a self-contained calibrate and test circuit to ensure correct operation regardless of the electrical noise in a given area or location; and a specific electrical schematic diagram.

3,721,231
CATHETER FOR HIGH PRESSURE INJECTIONS
Franz Hans Hubert, Carlstadt, N.J., assignor to Becton, Dickinson and Company, East Rutherford, N.J.
Filed Feb. 1, 1971, Ser. No. 111,285
Int. Cl. A61m *25/00*
U.S. Cl. 128—2.05 R 8 Claims



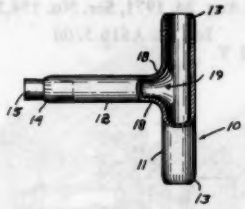
A medical catheter is formed from a hub within which an elongated flexible tube is disposed. The bore of the tubing within the hub is tapered to accept the tapered tip of a male connector. The tubing is coextensive with the shaft of the hub. A method for fabricating the medical catheter involves mounting the hub on a mandrel, which has a tapered portion, adapted to be positioned within the hub, and an elongated pilot extending from the tapered portion through the hub. Heat softenable catheter tubing is fed onto the tapered portion until resistance is met, then the tubing while heat softened, is forced over the tapered portion of the mandrel in the recess between the tapered portion and the hub. The tubing is solidified and the joined catheter removed from the mandrel.

3,721,232
SURGICAL PAD METHOD FOR DECUBITUS ULCER MANAGEMENT
Sidney C. Trenchard, Westmont, N.J., assignor to Margaret R. Trenchard, Westmont, N.J.
Filed May 24, 1968, Ser. No. 731,864
Int. Cl. A61h *1/00*
U.S. Cl. 128—24 R 9 Claims



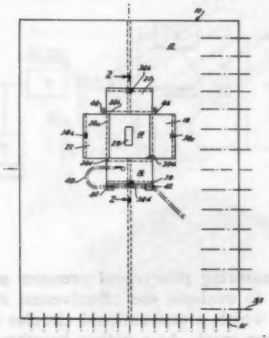
Method and surgical system for decubitus ulcer management, in which the surgical devices in the system each comprise a flexible, fluid-impervious bladder containing a gel or jelly formed as a colloidal system from water and a water-soluble resin which is a carboxy vinyl polymer of extremely high molecular weight and capable of displacement or flow within the bladder distributing the weight of the body of the user supported thereon. The mucilage or jelly has some form of elasticity and has yield value, both of which are controllable and variable and is capable of distributing pressure over an entire portion of the body resting on the bladder and avoids excessive pressure points thereon.

3,721,233
T-SHAPED TRACHEAL STENT
William W. Montgomery, 3 Wachusett Road, Wellesley, Mass., and Eugene B. Hood, 211 Vine Street, Duxbury, Mass.
Filed Oct. 30, 1970, Ser. No. 85,530
Int. Cl. A61m *16/00*
U.S. Cl. 128—351 2 Claims



A T-shaped stent for use following surgical reconstruction of the cervical trachea and surgical correction of tracheal and subglottic stenosis. The stent comprises a tubular intraluminal portion and a tubular tracheotomy portion connected thereto between its ends and provided with a removable plug. The tubular portions are of a resiliently yieldable stock enabling the ends of the intraluminal portion to be folded together or against the tracheotomy portion for insertion and removal through a tracheotomy orifice. The intraluminal portion provides internal support for the repaired part of the trachea and the cross sectional area of the tracheotomy portion increases at its junction with the intraluminal portion to an axial extent such that external tapering surfaces are provided for entry into the posterior end of the orifice to provide molding support for and overcorrecting the inferior margin of adjacent portions of the anterior tracheal wall.

3,721,234
DISPOSABLE SURGICAL COVER SHEET
Frederick B. Hadtke, New Providence, and Martin P. Galen, Parsippany, both of N.J., assignors to Becton, Dickinson & Company, East Rutherford, N.J.
Filed April 23, 1971, Ser. No. 136,840
Int. Cl. A61t *13/00*
U.S. Cl. 128—132 D 9 Claims



A disposable, surgical cover sheet is provided comprising a main sheet formed of a nonwoven, cellulosic material having an enlarged opening therein, the opening covered by a sheet of plastic material. The plastic sheet is secured to the main sheet along a bonding zone surrounding the main sheet opening. A the bonding of absorbent pads is also provided surrounding the opening and secured to the main sheet and plastic sheet in thebonding zone. Portions of the plastic sheet project beyond the bonding zone and ma; be used to retain a

suction tube or the like without risking the puncture or tearing of the cover sheet as a result of mishandling of the tube.

3,721,235

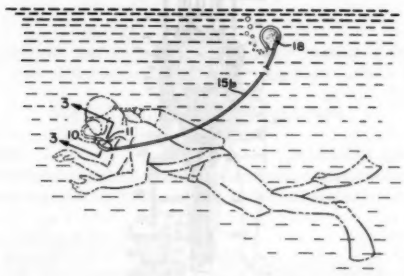
BUBBLE TRANSFER DEVICE FOR OPEN SYSTEM SCUBA DIVING APPLICATIONS

Stephen D. Ball, 3004 Altadena Avenue, San Diego, Calif., and Gary L. Keck, 4137 Front Street, San Diego, Calif.

Filed July 19, 1971, Ser. No. 163,851

Int. Cl. A62b *7/04*

U.S. Cl. 128—142.2 **6 Claims**



A device readily attached to a conventional scuba regulator mouthpiece ensures a controlled venting of exhaust gases at a remote location thusly removing bubbles from the diver's immediate vicinity. Exhaust gases are fed into a hollow body member and outwardly displace a flexible diaphragm member. Outward displacement of the diaphragm member removes it from its position normally sealing the inlet orifice of an exhaust tube leading to the remote location. Immediately after the exhalation portion of the breathing cycle, the diaphragm member is returned to its normally sealing position on the exhaust tube to prevent free flow of the scuba regulator during the remainder of the breathing cycle.

3,721,236

DIVING MASK WITH TRANSPARENT FACE PLATE

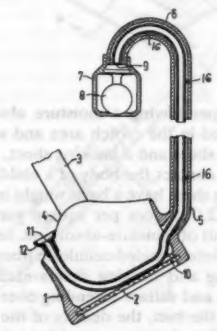
Heinz Erich Bardehle, Herrnstrasse 15, Munich, Germany

Filed July 23, 1970, Ser. No. 57,540

Claims priority, application Germany, July 31, 1969, P 19 39 019.3

Int. Cl. A62b *7/12*; A61m *16/00*

U.S. Cl. 128—145 A **6 Claims**



This invention relates to diving masks with a snorkel wherein an exhaling tube is led from the mouth through the snorkel to the end of the snorkel to prevent fogging inside the mask.

3,721,237

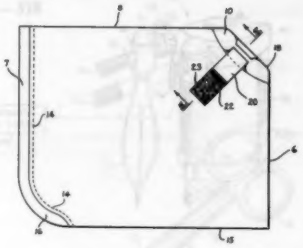
HEEL AND ANKLE PROTECTOR

Dino Alessio, Mission, Kans., assignor to H. G. Enterprises

Filed July 13, 1970, Ser. No. 54,208

Int. Cl. A61b *19/00*

U.S. Cl. 128—149 **4 Claims**



A heel and ankle protector of sheet polyurethane of sufficient thickness to have a cushioning action, which has a body portion made of a single ply of polyurethane. The body portion is generally rectangular except for a slightly widened portion at one end for mounting Velcro fasteners thereon, and a side edge straight throughout the major portion of its length, with a central notch of modified V shape. The notch has curved edges secured together to form a socket for receiving the heel. The straight edge portions are fastened together so that a pocket is formed to enclose the ankle and heel when the two portions of the Velcro fastener are secured together to overlap the corners of the body portion at its wider end.

3,721,238

DISPOSABLE ANESTHESIA DEVICE

Lewis Abraham Wise, and John E. Grimm, both of Milwaukee, Wis., assignors to Will Ross, Inc., Milwaukee, Wis.

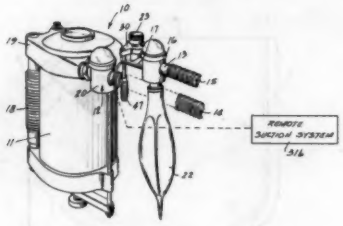
Filed Oct. 29, 1970, Ser. No. 85,201

Int. Cl. A61m *17/00*

U.S. Cl. 128—188 **15 Claims**

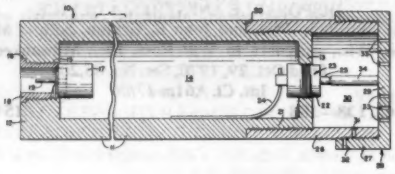
A disposable anesthesia device that is completely assembled and ready to use in administering anesthetic gas from a source thereof to a patient. The device provides a closed circuit connectable with a conventional anesthesia machine and consisting of a face mask, a rebreathing bag, a canister containing granular carbon dioxide absorbing material, flexible inhalation and exhalation tubes connecting the face mask with the canister and the rebreathing bag, and flap-like inhalation and exhalation valves, all parts of the device, with the exception of the granular canister contents, but including the valves, being molded or otherwise made of plastic and hence economically disposable after one use thereof to preclude the danger of patient cross contamination.

3,721,239
ANESTHETIC GAS EXHAUST SYSTEM
Robert T. Myers, 2521 W. Bacon Drive, Peoria, Ill. 61614
Filed July 9, 1969, Ser. No. 840,439
Int. Cl. A61m *17/00*
U.S. Cl. 128—188 **21 Claims**



A system utilizing the air suction system of an operating room to exhaust anesthetic gases from an anesthesia supply in assembly and especially in a preferred embodiment by use of an exhaust manifold in association with the pop valve of a rebreather system.

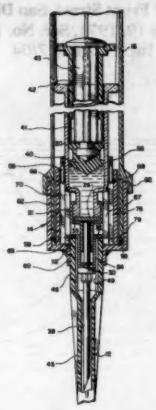
3,721,240
MECHANICAL SMOKING DEVICE
Michael Tamburri, 22 Harvest Avenue, East Hanover, N.J.
Continuation-in-part of Ser. No. 767,051, Sept. 30, 1968, abandoned, which is a continuation-in-part of Ser. No. 584,277, Oct. 4, 1966, abandoned. This application Nov. 10, 1970, Ser. No. 88,273
Int. Cl. A61m *15/06*
U.S. Cl. 128—208 **7 Claims**



This specification discloses a smoking device to be carried on the person of a user as one does a cigar, cigarette, or pipe and which includes a refillable storage chamber for a liquefied flavored and perfumed gas under pressure, said chamber having an inlet or refill valve and a discharge valve connecting with a suction chamber having an air passage to facilitate sucking or puffing of gases from the suction chamber.

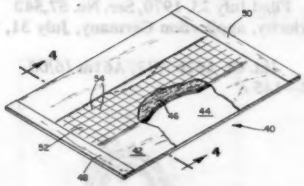
3,721,241
RIGID CONTAINER ASSEMBLY FOR SYRINGE
Robert Klohr, Fenton; Edward R. Tascher, Manchester; John W. Beld, O'Fallon, and Elmer A. Koenig, Kirkwood, all of Mo., assignors to Sherwood Medical Industries, Inc.
Filed April 8, 1970, Ser. No. 26,681
Int. Cl. A61m *5/00*
U.S. Cl. 128—221 **10 Claims**

A rigid packaging container assembly for protecting, and assisting the arming of a sealed prefilled syringe barrel and insertable needle assembly including a sheath surrounding the needle assembly, slidable on the barrel and having a shoulder which engages a portion of the needle assembly to permit the operator to grasp the sheath and fully insert the needle assembly from a partially inserted position, with a sheath retainer surrounding the sheath and having a plurality of shelf projections extending through openings in the sheath and engageable with the underside of the syringe barrel to limit sliding movement of the sheath retainer upwardly along the syringe barrel so that a cooperating cap insertable within the sheath retainer and engageable with a portion of the sheath



prevents movement of the sheath when the syringe is in its packaged condition thereby preventing arming of the syringe until the cover or cap is removed. There are also provided a plurality of tabs extending from the sheath so that in the disassembled condition of the container with only the sheath surrounding the needle assembly, the syringe will not be permitted to roll on a supporting surface.

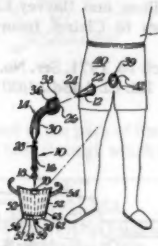
3,721,242
DISPOSABLE DIAPERS
Evelyn H. Krusko, Philadelphia, Pa., assignor to Scott Paper Company, Delaware County, Pa.
Filed March 30, 1970, Ser. No. 23,752
Int. Cl. A61f *13/16*
U.S. Cl. 128—287 **39 Claims**



Disposable diaper having a moisture absorbent fluff pad which is contoured in the crotch area and which is disposed between a facing sheet and a backing sheet, said facing sheet being adapted to contact the body of a child. Both the facing sheet and backing sheet have a basis weight in the range of approximately 1.0–2.0 ounces per square yard, and each are comprised of a batt of moisture-absorbent, self-sustaining, adhesively bonded, intermingled cellulosic fibers. The outer surface of the facing and backing sheets each have a pattern defined by ridges and valleys extending over substantially the entire surface of the batt, the density of the sheets in the regions of said valleys being greater than the density of the sheets in the regions of said ridges. A method for manufacturing the facing sheet and backing sheet of the disposable diaper by forming a randomly arranged, intermingled cellulosic fibrous batt having a basis weight of approximately 1.0 ounces per square yard, passing said batt through a nip defined

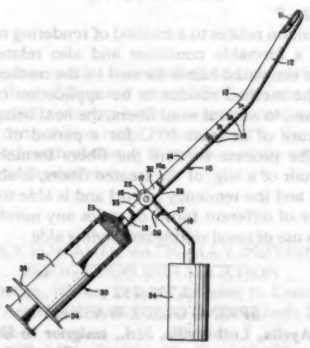
between a patterned roll and a moistened rubber roll to provide a pattern in one surface of the batt and raise a nap on the other surface, spraying opposite surfaces of said batt with adhesive, drying said adhesive and setting said adhesive.

3,721,243
MALE URINARY INCONTINENCE DEVICE
Dennis Hesterman, 910 5th St., Delaware City, Del. 19706, and Lewis E. Greth, Cinnaminson, N.J.; said Greth assignor to said Hesterman
Filed July 16, 1970, Ser. No. 55,399
Int. Cl. A61f *5/44*
U.S. Cl. 128—295 18 Claims



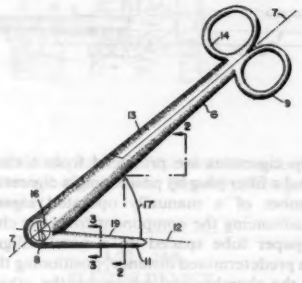
A male urinary incontinence device includes an elongated tubing which has an open proximal end for insertion over the male organ and an open distal end which communicates with a collector through conveying means. The tubing is designed to be compressible and extendable so as to create a negative pressure therein upon compression and subsequent extension.

3,721,244
MANUAL SUCTION CURETTAGE INSTRUMENTS
Leonard R. Elmaleh, New York, N.Y., assignor to Solly Scheiner, Great Neck, N.Y.
Filed Jan. 28, 1971, Ser. No. 110,407
Int. Cl. A61b *17/42*
U.S. Cl. 128—304 5 Claims



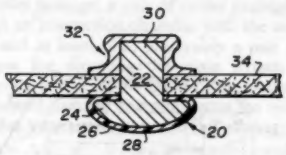
A disposable aspiration system for the manual performance of abortion during early uterine gestations includes a scoop-like curette tube adapted to be inserted in the vaginal uterine tract and an aspirator connected to the curette tube. In one form of the invention, a stopcock assembly is included between tube and aspirator to permit discharge of the aspirator during intermediate steps of the tissue removal process.

3,721,245
PAIR OF SURGICAL SCISSORS
Andrew J. Campbell, 1632 Dale Avenue, San Mateo, Calif.
Filed May 4, 1971, Ser. No. 140,151
Int. Cl. A61b *17/32*
U.S. Cl. 128—318 1 Claim



A pair of surgical scissors includes two levers pivoted about a center axis and extending alongside a first axis at right angles thereto and having a pair of finger loops at their ends remote from the pivotal center axis. Forming part of one lever and extending from the center axis along a second axis at approximately 45 degrees to the first axis is one of the scissor blades. Similarly extending from the other lever alongside the same second axis is the other scissor blade. Preferably, the second blade is substantially solid so that the space between the two axes is approximately filled with the second blade terminating in a sharpened edge arcuate about the center axis and also sharpened along the second axis as is the first blade.

3,721,246
APPLICATOR ELECTRODES WITH A VERY THIN NON-METALLIC, CURRENT DISTRIBUTING LAYER
David M. Landis, Fullerton, Calif., assignor to Thomas & Betts Corporation, Elizabeth, N.J.
Filed Dec. 10, 1970, Ser. No. 96,893
Int. Cl. A61n *1/04*
U.S. Cl. 128—404 8 Claims



An improved body contacting electrode having a dry, current distributing, skin contacting layer selectively disposed adjacent a conductive portion thereof to provide a high resistance electrode uniquely arranged to effectively limit and uniformly disperse the current from an electrical source through the skin area adjacent the electrode. The current distributing layer is comprised preferably of conductive particles uniformly distributed in a nonconducting medium such as

resin or the like. Means are provided to couple the electrode to an external electrical source and to releasably support said electrode adjacent a preselected area of the body.

3,721,247

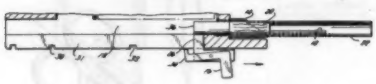
METHOD FOR CIGARETTE MAKING

Julian L. Paynter, 915 North College Avenue, Salem, Ind.

Filed March 9, 1971, Ser. No. 122,443

Int. Cl. A24c *5/42, 5/52*

U.S. Cl. 131—72 **1 Claim**



Filter tip cigarettes are produced from a charge of loose tobacco and a filter plug by positioning a cigarette component in a chamber of a manually operated cigarette making machine, advancing the component from the chamber into a cigarette paper tube spaced on a nozzle aligned with the chamber a predetermined distance, positioning the other component in the chamber and advancing the other component into the paper tube a predetermined distance. A manual cigarette maker operates to introduce, stepwise, a charge of tobacco and a filter plug into a cigarette paper tube affixed to the cigarette maker. The cigarette maker has a housing with the chamber adapted to receive the tobacco charge and filter plug, a nozzle adapted to hold the paper tube in communication with the chamber and a means for compressing the tobacco charge and filter plug for introduction into the paper tube. An elongated plunger has a stop forming an end wall of the housing chamber for injecting the tobacco charge and filter plug, stepwise, into the paper tube. First and second stop means on the housing are associated with the stop on the plunger for defining tobacco receiving and filter receiving compartments in the housing chamber. To properly index the cigarette components in the cigarette paper tube the axial length of the plunger is less than the axial length of the tobacco receiving compartment.

3,721,248

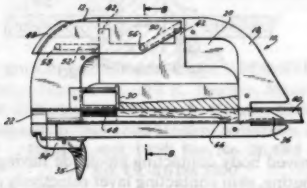
CIGARETTE MAKING APPARATUS

Julian L. Paynter, 915 N. College Avenue, Salem, Ind.

Filed April 7, 1971, Ser. No. 131,997

Int. Cl. A24c *5/42, 5/52*

U.S. Cl. 131—72 **2 Claims**



In manual cigarette making apparatus a housing is provided having a chamber with a channel at an end of the chamber to receive tobacco and a filter. The housing has an opening for admitting tobacco and a filter into the chamber adjacent the channel. A compacting slide mounted within the housing is adapted for movement toward and away from the channel for compressing the tobacco and for moving the filter into the channel. An improved mechanism to move the compacting slide with respect to the channel employs an elongated actuator mounted in the housing adapted for reciprocal movement with respect to the housing. The actuator is connected to the compacting slide and is adapted to move the slide either toward or away from the channel during reciprocation.

3,721,249

Patent Not Issued For This Number

3,721,250

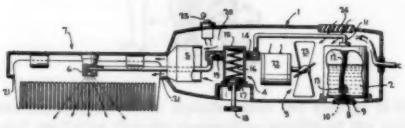
MIST APPLICATOR COMB

Henry J. Walter, Wilton, and Harvey Levine, Fairfield, both of Conn., assignors to Clairol Incorporated, New York, N.Y.

Filed April 16, 1971, Ser. No. 134,656

Int. Cl. A45d *24/00*

U.S. Cl. 132—11 A **3 Claims**



The subject invention relates to a comb having a handle in which is situated a reservoir for water or other liquid and having means for spraying the fluid from the reservoir directly on the hair while combing. Also provided is a hot air generating system which allows hot air to be blown on the hair while the comb is being used. The heater of the hot air generating system may be used to heat the fluid which is sprayed directly on the hair.

3,721,251

METHOD OF MANUFACTURING WIGS

Leonie Kathleen Mason, Christchurch, New Zealand, assignor to Lori Lana Wigs Limited, Christ Church, New Zealand

Filed Oct. 14, 1970, Ser. No. 80,770

Claims priority, application New Zealand, July 16, 1970, 160847

Int. Cl. A45d *7/02*

U.S. Cl. 132—7 **6 Claims**

This invention relates to a method of rendering natural wool fibers into a formable condition and also relates to a wig wherein the simulated hair is formed by the method of this invention. The method resides in he application of dry heat, such as steam, to natural wool fibers, the heat being applied at a temperature of at least 50°C for a period of at least 30 seconds. The process renders the fibers formable and the simulated hair of a wig, of the treated fibers, is able to retain springiness and the tendency to curl and is able to be set into any number of different forms or styles any number of times without the use of usual setting and styling aids.

3,721,252

SPRING GUIDE WASHER

Robert J. Ayella, Lutherville, Md., assignor to United States Catheter and Instrument Corporation, Glen Falls, N.Y.

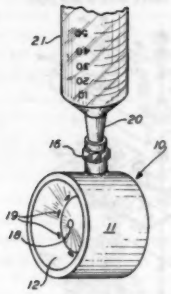
Filed April 1, 1971, Ser. No. 134,097

Int. Cl. B08b *3/02, 11/00*

U.S. Cl. 134—122 **3 Claims**

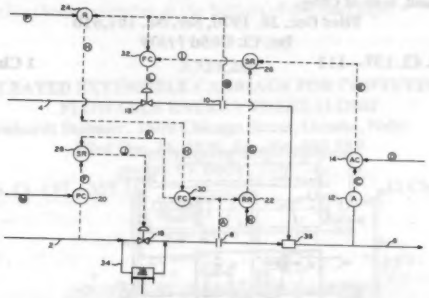
A spray head adapted for connection to a supply of washing liquid under pressure, such as a water-filled syringe, the spray head having a hole through which a spring guide may be

drawn and a plurality of jet openings through which streams of liquid can be projected from several directions toward a point



of convergence located in the path of the spring guide and adjacent one end of the hole through which it is passed.

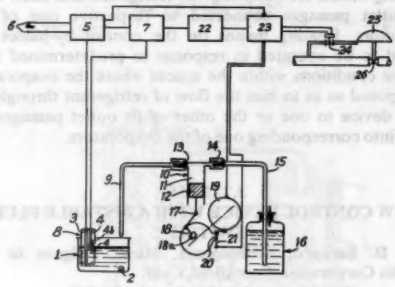
3,721,253
CONTROLLING APPARATUS AND METHOD
Marvin A. Remke, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.
Filed Sept. 24, 1971, Ser. No. 183,473
Int. Cl. G05d *11/02*
U.S. Cl. 137—3 **10 Claims**



This invention resides in a method and apparatus for controlling the flow of first and second fluid streams together to form a composite stream having a preselected composition range. Said composition range is maintained by the controlling apparatus and method during fluctuation of the supply of one or both of said fluid streams.

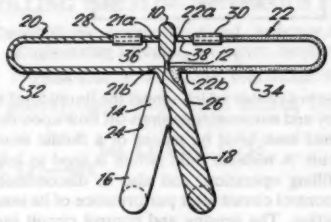
3,721,254
DEVICE FOR AUTOMATICALLY DRIVING AN IRRIGATION INSTALLATION
Pierre L. Rutten, Nimes, France, assignor to Compagnie Nationale D'Amenagmt de la Region du Bas-Rhode Languedoc, Nimes, France
Filed Feb. 3, 1971, Ser. No. 112,182
Claims priority, application France, Feb. 9, 1970, 7004535
Int. Cl. A01g *25/00*
U.S. Cl. 137—78 **7 Claims**

This invention relates to a device for automatically controlling the manoeuvres of motorized obturators controlling the distribution of irrigation water, composed of a cyclic programmer, an evaporation tank which automatically controls the starting of the programmer and means, controlled by the



programmer and independent of the obturators, for injecting a determined amount of water into the tank, during each cycle of the programmer.

3,721,255
FLUIDIC DEVICE
Fumio Suzuki; Fumio Naito, and Shoji Sugaya, all of Osaka, Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan
Filed Aug. 20, 1970, Ser. No. 65,492
Claims priority, application Japan, Aug. 23, 1969, 44/66596
Int. Cl. F15c *1/04*
U.S. Cl. 137—807 **12 Claims**



A fluidic device comprising an inlet passage for receiving a heat vaporizable supply liquid, a main power nozzle connected to the inlet passage, a pair of outlet passages communicated through an interaction chamber with the outlet of the power nozzle and at least one, preferably a pair of by-pass control passages for directing the main stream of liquid through the device to one or the other of the outlet passages. The by-pass control passage communicates the inlet passage directly with the interaction chamber by-passing the power nozzle.

It includes heating means for vaporizing the flow of liquid therethrough. A small portion of the main liquid stream through the inlet passage of the device is diverted to the control by-pass to be used as control flow. During passage through the control by-pass, the control liquid flow may be vaporized into gas flow by heating means. The vaporization of the control liquid causes a decrease in the mass flow of the control fluid which is effective to produce a transverse pressure differential across the main liquid stream through the interaction chamber sufficient to bias it for flow through the desired one of the two outlet passages.

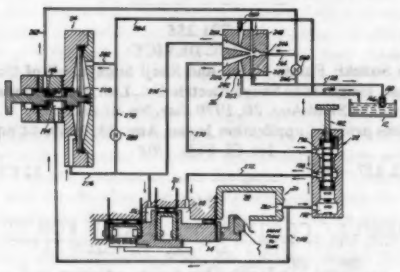
A refrigeration system includes a pair of evaporators, means for supplying a liquid refrigerant to the evaporators and a fluidic device of the type described. The fluidic device is provided between refrigerant supplying means and a pair of evaporators with its inlet passage connected to refrigerant supplying means for receiving the refrigerant and each of its two outlet passages connected to respective one of the evaporators. Heating means on the control by-passes are adapted to be operated in response to predetermined temperature conditions within the spaces where the evaporators are disposed so as to bias the flow of refrigerant through the fluidic device to one or the other of its outlet passages for supply into corresponding one of the evaporators.

3,721,256

FLOW CONTROL DEVICE WITH A BISTABLE FLUID SWITCH

Daniel D. Barnard, Birmingham, Mich., assignor to The Bendix Corporation, Southfield, Calif.

Filed Sept. 30, 1970, Ser. No. 76,868
Int. Cl. F15c *1/10, 3/04*
U.S. Cl. 137—81.5 **16 Claims**



A flow control device which senses the liquid level in a tank filled thereby and automatically shuts off flow upon reaching a predetermined tank level by means of a fluidic sensing and control circuit. A bistable fluid switch is used to initiate the automatic filling operation, and also to discontinue supply flow to the control circuit after performance of its sensing and control function. The sensing and control circuit includes a monostable jet-on-jet fluid amplifier with a power jet which is switched to an alternate outlet by a sensing line disposed in the tank with floats adapted to block the sensing line upon attainment of the predetermined level, the output of the alternate outlet causing operation of a main flow control valve to discontinue further flow, as well as to operate the bistable fluid switch to discontinue supply flow to the fluid amplifier.

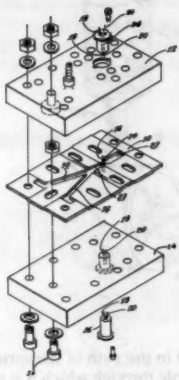
3,721,257

ELECTRO-FLUIDIC SIGNAL CONVERTER

Michael J. De Santis, Lyndhurst; Robert H. Page, Piscataway, and Edward L. Rakowsky, Kinnelon, all of N.J., assignors to The Singer Company, New York, N.Y.

Filed June 8, 1971, Ser. No. 151,031
Int. Cl. F15c *1/04*
U.S. Cl. 137—828 **3 Claims**

An improved digital device is provided for converting alternating current or direct current electrical signals into corresponding fluidic signals either of the pressure or flow type. The device of the invention is basically a bi-stable fluid amplifier having a multiplicity of heating wires mounted in the power jet port thereof. These wires act to impede the gas flow through the port, and the physical impedance of the wires to the gas flow is a function of the heating electric current flowing through the wires. As will be described, the wires control the device to produce a desired fluidic output in response to



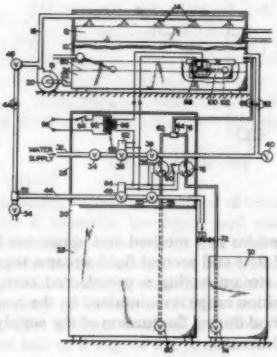
an electric signal input which gives rise to heating electric currents in the aforesaid wires.

3,721,258

APPARATUS FOR SUPPLYING COOLANT LIQUID FOR REFRIGERATION COILS

John F. Dermiah, 2221 S. Glenmorrie Drive, Lake Oswego, and Delmar L. Montgomery, 4323 N. E. 66th Avenue, Portland, both of Oreg.

Filed Dec. 28, 1970, Ser. No. 101,610
Int. Cl. G05d *11/00*
U.S. Cl. 137—111 **1 Claim**



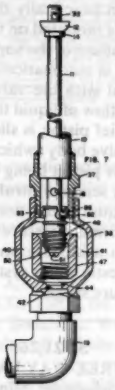
A concentrated aqueous solution of corrosion inhibiting chemical is metered from a container through an electrically operated metering pump and chemical supply line to the sump of a cooling tower for mixing with cooling water contained in the sump. Pump operation is controlled by an electric switch which is operated by a float in the sump. The electric switch also controls operation of a solenoid valve in a make-up water supply line to the sump, which line is independent of the chemical supply line. A second electrically operated metering pump may be controlled by the switch to meter acid from a receptacle to the sump to maintain the pH of the coolant liquid at a desired level.

3,721,259

APPARATUS FOR REMOVING FLUIDS FROM FLUID SUPPLY PIPES

Cecil Wayne True, 825 South Maple St., Watertown, S. Dak.

Filed Sept. 9, 1971, Ser. No. 179,107
Int. Cl. F16k *1/00*
U.S. Cl. 137—270 14 Claims



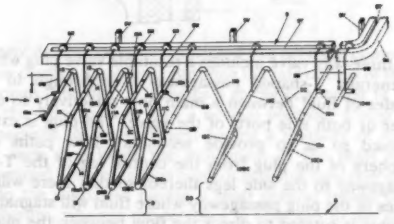
A rigid, hollow pipe having an external diameter which is smaller than the diameter of a riser pipe is provided with a resilient washer near one end; so that upon insertion of that end of the hollow pipe into the riser pipe, the washer compresses liquid in the riser pipe and forces it up through the hollow pipe where it is discharged from an opening at the other end thereof. The hollow pipe also is used to insert and operate a valve closing member at the bottom of the riser pipe.

3,721,260

PLEATED EXTENSIBLE CARRIAGE FOR CONVEYING FLOWABLE ENERGY THEREALONG

Bernhardt Stahmer, 1509 Chicago Street, Omaha, Nebr.

Filed Dec. 16, 1971, Ser. No. 208,559
Int. Cl. B65h *75/36*
U.S. Cl. 137—355.16 12 Claims



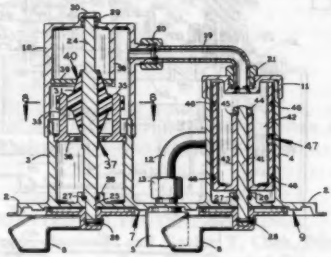
There is described herein a pleated carriage longitudinally extensible along and guidable by a tracking means and adapted to convey in conduit and other pleated paths therealong flowable energy sources to reciprocating machines. The longitudinally extensible pleated carriage comprises for consecutive carriage pleats a transversely extending shoulder member together with a pair of transversely separated elongate upright legs that have a longitudinally spreadable relationship with respect to each other and to the shoulder, consecutive pleats remote of the shoulder and at opposite legs being connected with a transversely extending bridge member; when flexible conduits are employed, there are means to protect them from pinching, kinking, or undue strain as the carriage is longitudinally extended and retracted.

3,721,261

TEMPERATURE AND WATER DISTRIBUTION REGULATING MECHANISM FOR BATHTUBS AND WASHBASINS

Ildefonso Martinez, Miami, Fla.

Continuation-in-part of Ser. No. 837,762, June 30, 1969, abandoned. This application May 17, 1971, Ser. No. 145,075
Int. Cl. F16k *19/00*
U.S. Cl. 137—597 5 Claims



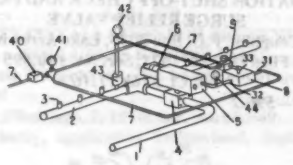
A water control device having a manual control for selectively mixing and dispensing quantities of hot and cold pressurized water to a predetermined desired temperature within the temperature range of the hot and cold water and conducting same into a distribution cylinder controlled by a second manual control which may be adjusted from an "off" position to conduct the water to and from a spout for tube use or conduct the water to and from a shower heat at the aforesaid desired temperature.

3,721,262

PRESSURE CONTROL APPARATUS FOR CONTROLLING THE FLOW OF VISCOUS FLUIDS

Peter Twatt Work, Irvine, Scotland, assignor to Ceramic Engineering Limited, Glasgow, Scotland

Filed Dec. 1, 1971, Ser. No. 203,557
Claims priority, application Great Britain, Dec. 4, 1970, 57,696/70
Int. Cl. F16k *31/36*
U.S. Cl. 137—488 4 Claims

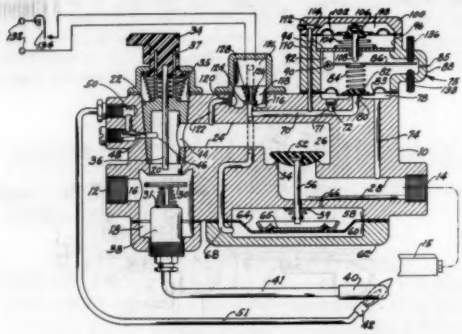


This invention relates to pressure control apparatus for controlling the flow of viscous fluids particularly casting slip from a main supply to a feed manifold and comprises a ball valve located in the main supply to allow or prevent the flow of slip to the feed manifold. The ball valve is actuated by an actuator device and damper means and the actuator is controlled by a pressure regulating valve and a pressure sensitive relay valve which monitors the fed manifold pressure and supplies a signal to actuate the pressure regulating valve which converts a signal of low flow characteristics to an equal signal pressure of high flow characteristics.

3,721,263
STEPPED OPENING FLUID PRESSURE OPERATED VALVE

Charles D. Visos, Manchester, and John J. Love and Ralph E. Banes, St. Louis, Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Nov. 10, 1971, Ser. No. 197,438
Int. Cl. F16k 31/12
U.S. Cl. 137—495 8 Claims



A biased closed gas valve controlling a main passageway is moved openward by a first expansible chamber as it expands. A restricted pressure passageway having a control valve therein connects the chamber with the upstream side of the gas valve and a more highly restricted bleed-off passageway connects the chamber with the downstream side of the gas valve. The pressure in the chamber therefore increases and the gas valve is moved openward when the control valve is opened. A bypass controlled by a biased closed pressure regulator valve permits additional bleed off so as to limit opening of the gas valve to a predetermined partially open position. A second, smaller, expansible chamber having a lost motion operative connection with the pressure regulator operates when it has expanded a predetermined amount to increase the closing bias on the regulator valve, thereby reducing the bleed off through the bypass and causing the gas valve to be fully opened. A passageway connects the second, smaller, expansible chamber with the first expansible chamber and includes a restricting orifice to delay expansion of the second smaller chamber.

3,721,264
COMBINATION SHUT-OFF CHECK AND PRESSURE SURGE RELIEF VALVE

Donald W. Coughlin, P.O. Box 2025, Lake Arrowhead, Calif.

Filed Oct. 20, 1971, Ser. No. 190,895
Int. Cl. F16k 11/10
U.S. Cl. 137—596.2 3 Claims

A threaded manually rotatable valve stem screws into the valve body with the valve head slideably mounted on the inner end of the stem and biased downwardly by a very light coil spring into engagement with the valve seat. When the stem is screwed to its innermost limit, it positively forces the valve head against the valve seat in "shut-off" position. When water under substantial (normal) pressure is delivered to the in-flow chamber of the valve, its flow through the valve is prevented when the latter is thus shut off. When the stem is now reversely screwed manually to release the valve head from downward pressure by the stem, the incoming water pressure readily overcomes the light spring pressure biasing the valve head downwardly and lifts the valve head until further upper movement of the valve head is prevented by its coming into contact with the stem. This of course opens the valve to a flow of water through the same, with practically the same effect as if the valve head were directly mounted on the stem.

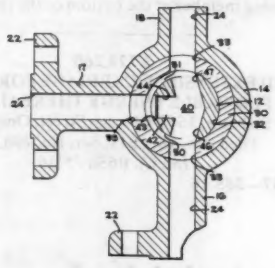
When a temporary failure of the supply of water to the valve occurs, the valve head is automatically lowered by its biasing spring into engagement with the valve seat, thus closing the valve against a reverse flow of liquid therethrough.

A pressure surge relief piston is slideable on said stem in a bore provided in the valve body (which bore connects with the out-flow chamber), this piston being biased downwardly by a heavy coil spring, with screw controlled tension, said tension being set to confine liquid under normal operating pressures but to yield to an abnormal pressure surge, thereby uncovering ports leading from said bore and relieving the out-flow chamber and the domestic water system connected therewith of said abnormal pressure surge.

3,721,265
THREE-WAY VALVE

Joseph V. Hoffland, Minneapolis, Minn., assignor to FMC Corporation, San Jose, Calif.

Filed April 29, 1971, Ser. No. 138,507
Int. Cl. F16k 11/00
U.S. Cl. 137—625.47 6 Claims



A three-way valve includes a rotatable valve plug which has a generally T-shaped passageway therethrough to permit transfer of fluid between a main port selectively to or from either or both side ports of the valve. The plug is exteriorly recessed so as to provide secondary flow paths on the periphery of the plug from the central leg of the T-shaped passageway to the side legs thereof so that there will be no spaces in the plug passageway where fluid will stagnate when the plug is rotated to direct the flow between the main port and only one of the side ports.

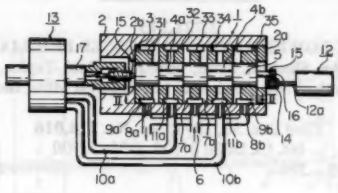
3,721,266
ROTARY PILOT VALVE

Yo Ikebe; Jun Ikebe, both of Tokyo, and Seiuemon Inaba, Kawasaki-shi, all of Japan, assignors to Fujitsu Limited, Kawasaki-shi, Japan

Filed Nov. 18, 1970, Ser. No. 90,638
Claims priority, application Japan, Nov. 19, 1969, 44/109822; Nov. 19, 1969, 44/109823
Int. Cl. F16k 11/00
U.S. Cl. 137—625.69 2 Claims

In the rotary pilot valve of the present invention, the opening area of the port varies with a linear relation to the amount

of the displacement of the spool, only when the amount of the displacement of the spool is small. In the high speed feeding range, the above-mentioned linear relation is not necessary.



Accordingly, in the above-mentioned range, the ratio between the amount of the displacement of the spool and the amount of the opening area of the port has a larger quantity than the ratio in the above-mentioned linear relation.

3,721,267

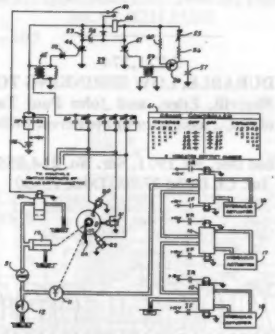
VALVE CONTROL DEVICE

Arthur F. Sholl, Omaha; Donald L. Wolfe, Wahoo, and Armando R. Benitez, Omaha, all of Nebr., assignors to Paxton-Mitchell, Omaha, Nebr.

Filed Oct. 28, 1971, Ser. No. 193,277

Int. Cl. F15b *11/04*

U.S. Cl. 137—624.18 **11 Claims**



A control device operably connected to a pressure compensated flow control valve for controlling the rate of flow of fluid therethrough. The device includes a spring connected to the shaft of the valve to bias it to a normal position, a stop assembly secured to the shaft and having a plurality of stops wherein each stop limits the movement of the shaft to a predetermined amount, a stop control actuator operably connected to the shaft and having a shaft control means connected thereto, wherein the actuator in response to the shaft control means is operable to apply force to the shaft to move it in step relation against the bias of the spring to any predetermined position as established by the position of the stops in step relation.

3,721,268

MULTIPORT VALVE WITH ROTATABLE COVER

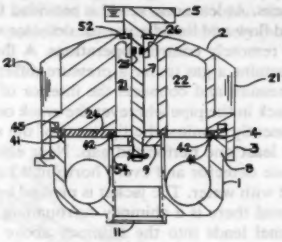
Glora Erlich, 220 West Jersey Street, Elizabeth, N.J., and Marc Lerner, Swan Lake, N.Y.

Filed Dec. 3, 1970, Ser. No. 94,727

Int. Cl. F16k *11/06*

U.S. Cl. 137—625.46 **13 Claims**

A multiport valve is provided having a valve body and a manually rotatable cover mounted on the body for selectively directing fluid flow among a plurality of influent and effluent lines. A valve seat comprising a unitary resilient seal ring is disposed between the rotatable cover and the valve body to



prevent internal and external leakage therebetween during rotation of the valve cover and in the selected position.

3,721,269

ORIENTED POLYBUTENE-1 TUBING

Luther J. Choate, Baytown, and Gaylon T. Click, Pearland, both of Tex., assignors to Petro-Tex Chemical Corporation, Houston, Tex.

Filed Nov. 23, 1970, Ser. No. 91,932

Int. Cl. B23b *27/00*; F16l *11/04*, *11/12*

U.S. Cl. 138—119 **2 Claims**

Oriented polybutene-1 flexible, collapsible tubing having the highest degree of tear strength is obtained by maintaining the ratio of machine direction orientation to transverse direction orientation in the range of about 0.7 to 0.9. Unexpectedly this ratio rather than a ratio of 1.Q which represents a balanced film gives the best tear strengths because of the crease lines formed in the tubing during production. The crease lines have a tear strength that totally disrupts the expectable and predictable tear properties of the tubing.

3,721,270

SAFETY INSTALLATION FOR PREVENTING POLLUTION BY PIPELINES

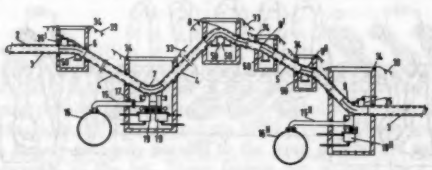
Gerard Francis Wittgenstein, 29 Champrond Way, Lausanne, Switzerland

Filed Sept. 2, 1970, Ser. No. 68,949

Claims priority, application Switzerland, Sept. 2, 1969, 13849/69

Int. Cl. F16l *55/00*

U.S. Cl. 138—104 **6 Claims**



A safety installation for preventing pollution by pipelines, is provided with at least one sector equipped with a jacket of

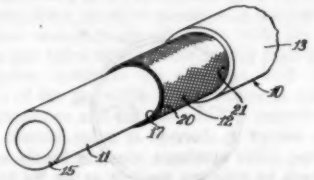
plastic material, the jacket surrounding the pipeline and being sealed at its ends on the latter, with the annular gap formed between the pipeline and its jacket containing a fluid and inserts and spaces. At least one vessel is provided for collecting the evacuated flow and liquid presence detector which gives a warning and remotely controls operations. A fluid-tight hollow space contains a gas under a pressure different from atmospheric pressure and connects the interior of at least one vessel to a crack in the pipe wherever the crack occurs. Instruments permanently monitor the tightness of the space, which comprises at least one perforated gap. Near each vessel is a liquid presence detector and every horizontal run gap of the space is filled with water. The jacket is pierced by at least one perforation, and there is a chimney surrounding the perforation. A channel leads into the chimney above the level of water and leas to a vessel to form part of the space. Every inclined run gap of the space is perforated at a low point in its jacket, and the channel surrounding the perforation and leading to the vessel forms part of the space.

3,721,271

HOSE CONSTRUCTION

Anil H. Chudgar, Manitowoc, Wis., assignor to Imperial-Eastman Corporation, Chicago, Ill.

Filed Oct. 28, 1971, Ser. No. 193,250
Int. Cl. F16l *11/00*
U.S. Cl. 138—141 **13 Claims**



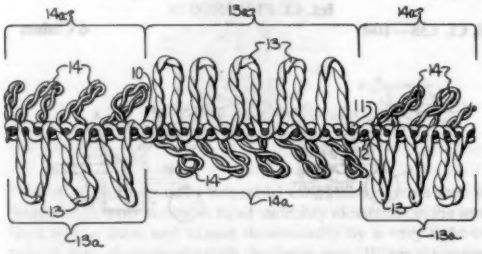
A hose construction having an inner tubular portion defining an outer substantially smooth nylon surface and reinforcing means surrounding the outer surface and having nylon fibers nonsolvently, autogenously bonded to the duct surface. Alternatively, or cumulatively, the reinforcing nylon fibers may be nonsolvently, autogenously bonded to the inner surface of a surrounding sheath having an inner substantially smooth nylon surface. A plurality of reinforcing layers may be provided. The securing of the reinforcing fibers to the confronting nylon surface means is effected substantially free of hooked interlocks therebetween.

3,721,272

TERRY FABRIC HAVING HIGH-LOW PILE

John Grayson Hager, Fieldale, Va., assignor to Fieldcrest Mills, Inc., Eden, N.C.

Filed Dec. 30, 1971, Ser. No. 213,883
Int. Cl. D03d *27/08*; D06c *23/00*
U.S. Cl. 139—396 **5 Claims**



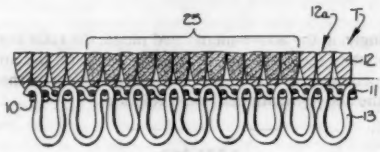
A woven terry fabric having on each side thereof a predetermined pattern of clearly defined high and low pile areas and wherein those terry yarns forming the low pile areas have pile loops of a length about as long as the height of the high pile areas but are self-restrained or disposed to lie at an incline relative to the base and form the low pile areas.

3,721,273

TERRY TOWEL HAVING ENHANCED BRILLIANCE

Ernest Kohn Sherrill, Eden, and John Paul Taylor, Greensboro, both of N.C., assignors to Fieldcrest Mills, Inc., Eden, N.C.

Filed Dec. 30, 1971, Ser. No. 214,018
Int. Cl. D03d *27/08*; D06c *23/00*
U.S. Cl. 139—396 **5 Claims**



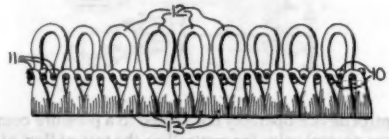
A woven terry towel having one face of cotton terry pile and having its opposite face of rayon terry pile exhibiting a high sheen or brilliance as compared to the cotton terry pile. Preferably, the rayon terry pile is in the form of cut pile and has a printed design or pattern of a suitable colorant thereon which penetrates the rayon cut pile very nearly to the base of the towel.

3,721,274

SOFT, DURABLE, LOW SHRINKING TOWEL

Ernest Kohn Sherrill, Eden, and John Paul Taylor, Greensboro, both of N.C., assignors to Fieldcrest Mills, Inc., Eden, N.C.

Filed Dec. 30, 1971, Ser. No. 214,055
Int. Cl. D03d *27/08*; D06c *23/00*
U.S. Cl. 139—396 **10 Claims**



A woven terry towel whose ground warp and/or filling yarns are composed of a blend of polyester and cellulosic fibers so as to increase the towel's resistance to shrinkage, increase the resistance of the selvage and hem areas of the towel to abrasion, increase the overall tensile strength of the towel, and to give the towel enhanced limpness and drape.

3,721,275

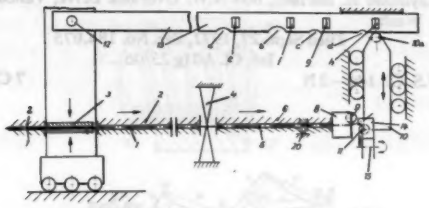
PROCESS AND APPARATUS FOR MAKING POLYGONAL SPECTACLE GLASS RIMS

Volker Redinger, Pforzheim, Germany, assignor to Robert Hellerich K.G., Eutingen, Baden, Germany

Filed Apr. 26, 1971, Ser. No. 137,482
Claims priority, application Germany, Sept. 12, 1970, P 20 45 240.8
Int. Cl. B21f *37/00*
U.S. Cl. 140—88 **16 Claims**

A profiled wire is cut into pieces having a desired length. Each of said pieces is fed through a curved pas-

sage having an outlet portion to prebend said piece. Each of said pieces having left said outlet portion is subjected to an automatically controlled, intermittent hammering



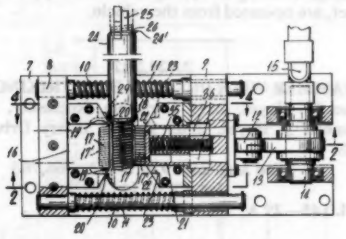
operation in a direction at an angle to said outlet portion to form predetermined bends in said piece after it has been prebent.

3,721,276

EYELET MAKING DEVICE FOR SPRINGS, TO BE COUPLED TO WINDING MACHINES AND OPERATING AT THE SAME OUTPUT SPEED OF THE LATTER

Enrico Lamperti, Via Ercole Ferrario 4, Gallarate, Varese, Italy

Filed June 26, 1970, Ser. No. 50,145
Claims priority, application Italy, June 26, 1969, 18726-A/69
Int. Cl. B21f *35/02*
U.S. Cl. 140—103 **11 Claims**



The device is for forming an anchoring ring on one or both of the ends of a helical spring. It comprises: guide means for the spring, spring gripping means in the form of jaws, at least one of which is movable, means on the sides of the jaw for eyelet bending at least one end of the spring and means for shearing the surplus wire, conveyor means are provided in the form of a cradle for receiving the spring and carrying it to the deformation zone.

The device is mounted at the discharge of a helical spring forming machine to finish springs with the end eyelets.

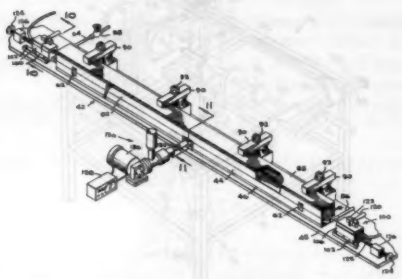
3,721,277

METHOD AND APPARATUS FOR SPLICING JACKETED CABLE

David Albert Rauscher, Columbia, S.C., and Robert Warren Alexander, Fort Lee, N.J., assignors to Carolina Steel and Wire Corporation, Lexington, S.C.

Filed June 30, 1971, Ser. No. 158,482
Int. Cl. B21f *15/06*
U.S. Cl. 140—111 **11 Claims**

A method of splicing cable encased in a plastic jacket is disclosed in which the jacket is removed for a given distance inwardly from the ends of the cable to be spliced, the strands are cut and interleaved to provide a mechanical splice portion which is then inserted in a mold and heated to a high temperature, liquid plastic at a high temperature is then injected in the mold to flow into the cable ports and open spaces and the mold is then cooled to provide a completely jacketed splice;



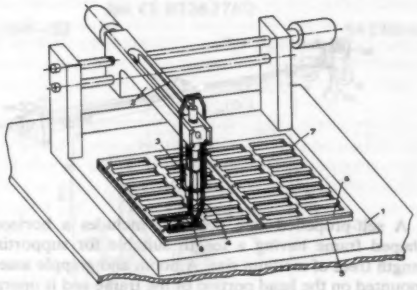
another aspect of the invention resides in the mold construction in which an inlet is provided centrally of an elongated hollow cylindrical mold with outlets being provided adjacent each end of the mold adjacent the ends of the cable splice so that hot plastic injected into the mold flows outwardly to expel all air in the mold and to consequently provide a more uniform jacket over the splice.

3,721,278

WIRE WRAPPING TOOL

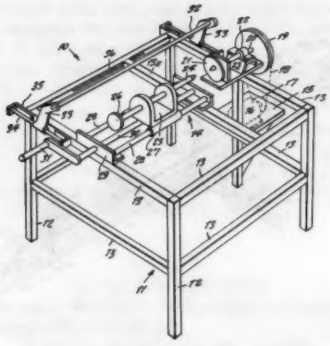
Bruno Staiger, 7121 Erligheim, Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Nov. 30, 1971, Ser. No. 203,403
Int. Cl. B21f *15/00*
U.S. Cl. 140—115 **5 Claims**



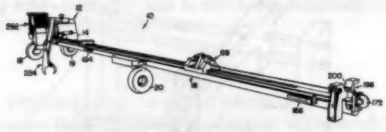
This invention relates to a wire wrapping tool to perform the disorderly arranged wiring of pin contact fields having high wiring density. An arrangement is provided for spreading the wiring adjacent the terminal pin being wrapped. Four spreading fingers generally parallel to the wrap gun bit are spaced outwardly of the bit. These fingers are secured by a ring member. Lever action of the fingers is produced by a second ring adjacent the upper edges of the fingers, the upper ring being movable axially to lever the fingers.

3,721,279
WOOD LATHE
Charlie L. Bowen, 1109 East Tenth Street, Lumberton, N.C.
Filed Jan. 21, 1971, Ser. No. 108,514
Int. Cl. B27c *7/06, 7/02*
U.S. Cl. 142—1 **2 Claims**



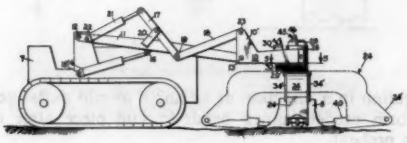
A wood turning lathe for handling objects from 6 to 40 inches round and up to 30 inches in length, the device comprising a frame around a large central space which affords sufficient space or room for a large object to swing, and the frame affording a motor driven chuck and a spindle unit between which the work is rotatably carried.

3,721,280
SELF-PROPELLED TREE DELIMBER
John Lischer French, Moline, Ill.; Kenneth Quentin Kessler, Dubuque, Iowa; Welker W. Funk, Fresno, Calif.; Victor Charles Pierrot, III, and Stanley Robert Hiseler, both of Dubuque, Iowa, assignors to Deere & Company, Moline, Ill.
Filed March 3, 1971, Ser. No. 120,501
Int. Cl. A01g *23/08*
U.S. Cl. 144—2 Z **18 Claims**



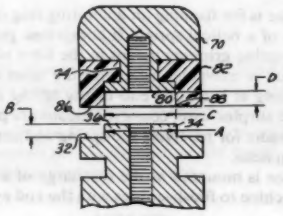
A self-propelled tree delimber includes a horizontal T-shaped frame having a length suitable for supporting full-length trees of medium size. A boom and grapple assembly is mounted on the head portion of the frame and is operable for lifting cut trees from the ground and placing them on the frame. A delimbing assembly is mounted for movement along tracks extending the length of the leg portion of the frame and includes pivoted blades arranged to receive and encircle the stem of a tree, when the tree is placed on the frame. A drive motor is mounted on the head portion of the frame and is drivingly connected to the delimbing assembly for propelling the assembly along the tracks to delimb any tree stem encircled by the blades. The leg portion of the frame is supported on a driven steerable wheel and the head portion of the frame is supported on a pair of driven wheels which are mounted for movement between working and transport positions for respectively moving the delimber perpendicular and parallel to its length. The leg portion of the frame is constructed in two sections which are disconnectible for shortening the length of the delimber for transport.

3,721,281
STUMP SPLITTER
Raymond H. Bartlett, 604 N.W. Overlook Drive, Vancouver, Wash.
Filed Sept. 27, 1971, Ser. No. 184,075
Int. Cl. A01g *23/06*
U.S. Cl. 144—2 N **7 Claims**



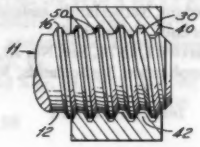
The splitting device is mounted on and operated from a tractor or other ground vehicle and includes an extending frame which can be raised, lowered or tipped. The frame rotatably supports an inverted U-shaped yoke member at its outer end. A pair of arms hingedly supported within the top of the yoke member are formed with opposed slicing blades at their lower ends. A pair of double-acting hydraulic cylinders at the bottom ends of the sides of the yoke member are connected to the bottom ends of the arms respectively. Hydraulic means for moving the arms and therewith the blades toward and away from each other, for rotating the yoke member, and for raising, lowering or tipping the frame supporting the yoke member, are operated from the vehicle.

3,721,282
HAMMER WITH DETACHABLE STRIKING TIPS
Raymon W. Hayes, 2879 Corinthia, Rochester, Mich., and Raymond J. Hayes, 2562 Patrick Henry Drive, Pontiac, Mich.
Filed Aug. 25, 1970, Ser. No. 66,763
Int. Cl. B25d *1/02*
U.S. Cl. 145—29 A **14 Claims**



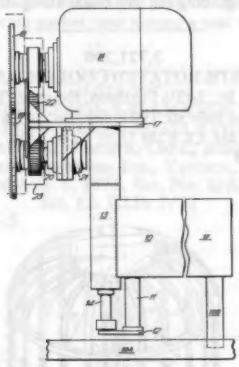
A hammer with specially designed removable striking tips so that a variety of striking surfaces, such as nylon, steel, brass, aluminum or the like, can be provided, each of the striking tips including an annular non-metallic belt disposed around a metallic insert adjacent the end of the tip which is threaded onto the hammer head. The nylon belt is pushed outwardly by an upstanding annular flange formed on the hammer head and is compressed between the striking tip and the hammer head as the end of the metallic insert is tightened down onto the flange, securing the striking tip onto the hammer head.

3,721,283
SELF-LOCKING FASTENER
Robert J. Evans, 1297 Porters Lane, Bloomfield Hills, Mich.
Filed Nov. 9, 1970, Ser. No. 88,008
Int. Cl. F16b *39/30*
U.S. Cl. 151—22 13 Claims



A self-locking screw adapted to have root interference with a mating female thread. The root of the screw, on entry, displaces the crest material of the female thread into the voids between the flanks of the mating members. The screw has a swaging flank which, upon withdrawal, forces the displaced material back toward the crest of the female thread, thus reworking the female thread to approximately its original form.

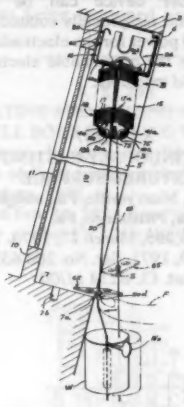
3,721,284
BUFFING MACHINE
Jan Herbert Farquhalson Kent, Saint Martin, Channel Islands, Great Britain, assignor to Kentvedder Limited, St. Saviour, Jersey, Channel Islands, Great Britain
Filed June 25, 1971, Ser. No. 156,613
Int. Cl. B29h *21/08*
U.S. Cl. 157—13 5 Claims



A buffing machine primarily for tires wherein two discs are mounted to revolve about parallel axes, each disc having teeth which cut in a common plane. The discs revolve in the same direction, the cutting action of their respective teeth being from opposite sides of the tire so as to eliminate thrust.

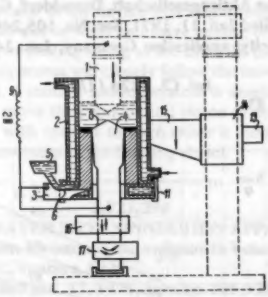
3,721,285
METHOD OF MAKING A VENETIAN-BLIND INSTALLATION
Victor Debs, Staten Island, N.Y., assignor to Levolor Lorentzen, Inc., Hoboken, N.J.
Filed May 29, 1969, Ser. No. 829,069
Int. Cl. E06b *9/26*
U.S. Cl. 160—166 4 Claims

A building wall is inclined to the vertical and has a window opening therein which is provided with a Venetian blind. The general plane of the window opening inclines similarly to the inclination of the wall, and the



plane of the ladder-and-slat assembly of the blind is inclined to correspond with the inclination of the window opening.

3,721,286
METHOD OF OBTAINING METAL HOLLOW INGOTS BY THE ELASTROSLAG REMELTING
Boris Evgenievich Paton, ulitsa Kotsjubinskogo, 9, kv. 21; Boris Medovar Izrailevich, bulvar Lesi Ukrainki, 2, kv. 8; Jury Vadimovich Latash, Vozdukhoflotsky prospekt, 81, kv. 14; Leonty Vasilievich Chekotilo, ulitsa Scherbakova, 49-a, kv. 10; Vitaly Mikhailovich Baglai, ulitsa semashko, 10, kv. 54/3; Viktor Leonidovich Artamonov, ulitsa Sovetskaya, 9, kv. 4; Rodimir Ivanovich Garkaljuk, ulitsa Bolshaya Kitaevskaya, 142, korpus 14, kv. 33; Viktor Anatolievich Timchenko, ulitsa Vladimirskaya, 98/3, kv. 36; Evgeny Federovich Malichekno, prospekt Entuziastov, 7/2, kv. 161; Leonid Mikhailovich Stopak, Brestlitovsky prospekt, 39, kv. 9, and Rudolf Solomonovich Dubinsky, Brestlitovsky prospekt, 4, kv. 15, all of Kiev, U.S.S.R.
Continuation of Ser. No. 771,165, Oct. 28, 1968, abandoned.
This application March 29, 1971, Ser. No. 129,168
Int. Cl. B22d *27/02*
U.S. Cl. 164—52 84 Claims



A method for electroslag remelting of at least one consumable electrode in a cooled mold assembly with a cooled bottom plate in which at least a part of the mold assembly is moved relative to the ingot being formed during forming of the ingot, and a device by which the method can be practiced. Movement of selective parts of the mold assembly relative to the ingot and/or the electrode is provided with or without move-

ment of the electrodes itself. Bottom pouring of molten slag is provided. A specific mold assembly has, as an element, a cooled core device enabling making hollow ingots, in which case the hollow core device can be moved axially, reciprocated axially and reciprocally rotated during forming of the ingot. Electrical power for the electroslag remelting can be connected between the consumable electrode and any or all elements of the mold assembly.

3,721,287

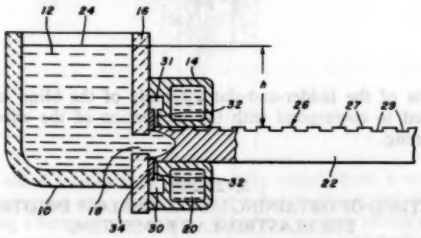
METHOD OF CONTINUOUSLY CASTING PLATE WITH TEXTURED SURFACE

Clement Roger Howle, Murrysville, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Division of Ser. No. 23,205, March 27, 1970. This application Nov. 19, 1971, Ser. No. 200,632

Int. Cl. B22d *11/00*

U.S. Cl. 164—73 **6 Claims**



Decorative plate or sheet having an attractive textured surface is continuously cast in an open ended chilled mold. The freezing plate ingot has a surface solidified in a varying and cyclic fashion by applying thereto a volatile lubricant at a rate much higher than that normally employed in similar casting arrangements. The resulting plate exhibits a textured surface with accompanying variations in composition and metallurgical structure such that the response to electrolytic anodizing treatments varies and the anodized surface exhibits varying shades and colors.

3,721,288

METHOD OF CONTINUOUS CASTING OF STEEL USING AN OSCILLATING MOLD

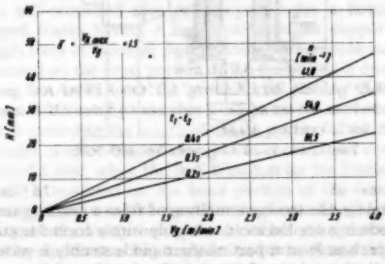
Gerd Vogt, Strump; Klaus Wunnenberg, Duisburg, and Joachim Dubendorff, Krefeld, all of Germany, assignors to Mannesmann Aktiengesellschaft, Dusseldorf, Germany

Filed Jan. 11, 1971, Ser. No. 105,240

Claims priority, application Germany, Jan. 14, 1970, P 20 02 366.9

Int. Cl. B22d *11/02*

U.S. Cl. 164—83 **1 Claim**



A method for continuous casting of steel with oscillating mold is disclosed according to which maximum mold oscillation speed, ingot withdrawal speed, oscillating frequency and displacement stroke for vertical mold oscillations are interrelated to permit welding of cracks in the ingot skin within periods of less than half a second per down stroke of the mold.

3,721,289

METHOD AND MEANS OF MAKING DIAMOND HEAT SINKS AND HEAT SINKS OBTAINED BY THIS METHOD

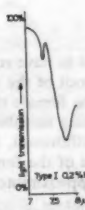
Michael Seal, Amsterdam, Netherlands, assignor to D. Drukker & ZN.N.V., Amsterdam, Netherlands

Filed March 11, 1970, Ser. No. 18,620

Claims priority, application Netherlands, March 13, 1969, 6903862

Int. Cl. H01l *1/12*

U.S. Cl. 165—80 **2 Claims**



A method of making diamond heat sinks for mounting small power-dissipating devices, such as semi-conductor devices and solid-state lasers, in which diamonds of the type II A are selected having a level or rising light transmission curve for infrared rays in the wave length range of 7 to 8 micrometer wave length. The selected diamonds are sawn into slices which are polished on both their sawn parallel faces and which are then cut in two directions normal to each other to obtain block-shaped diamond heat sink bodies of a weight in the range of 0.0005 to 0.02 carat. In sawing the diamond slices a saw guide comb is used for guiding the saw blade along straight paths.

3,721,290

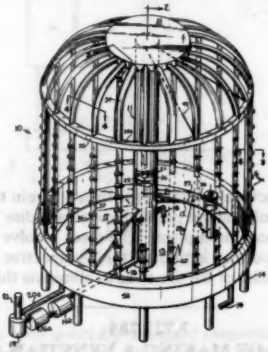
TOWER WITH ROTATED COOLING ASSEMBLY

Tony W. Butler, Jr., 242½ Portland, Houston, Tex.

Filed July 30, 1971, Ser. No. 167,624

Int. Cl. F28f *5/00*; F28b *1/06*

U.S. Cl. 165—85 **18 Claims**



The invention involves a cooling tower with tower column having a hollow, rotatably mounted turret thereon, from the substantial periphery of which a plurality of equally, angularly spaced apart hollow vanes are suspended. Exhaust steam entered into the column passes upwardly and outwardly in the turret to pass downwardly through the vanes into an annular, rotatably mounted receiver. The receiver discharges the cooled fluid into a fixed reservoir, preferably an annular tank.

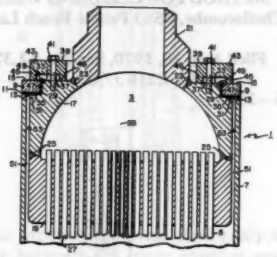
Air around the column rises and passes outwardly through the vanes in heat exchange relationship therewith. The vanes, at least in their upper portions, are so constructed and directed, that the passage of air therethrough tends to impart rotation to the assembly of turret, vanes, and receiver.

3,721,291

END CLOSURE FOR A HEAT EXCHANGER

Anthony A. Massaro, Jr., and George Bieberbach, both of Tampa, Fla., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 18, 1971, Ser. No. 172,853
Int. Cl. F28f *9/06*
U.S. Cl. 165—158 **9 Claims**



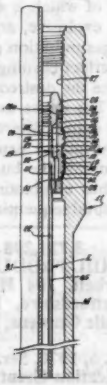
A shell and tube heat exchanger having a tube bundle, which is removable through the shell, and having a removable channel head, which forms an end closure and a header for the tubes, the channel head having an annular step, which registers with an inwardly directed flange on the shell to form a seal utilizing an O-ring type gasket, the channel head being fastened to the shell by a plurality of clamps, which are bolted to the head in such a manner to provide the proper sealing force on the O-ring gasket, and having a seal weld to insure a leak proof joint.

3,721,292

MARINE RISER LINER APPARATUS AND METHODS OF INSTALLING SUCH APPARATUS

Arthur G. Ahlstone, Ventura, Calif., assignor to Vetco Offshore Industries, Inc., Ventura, Calif.

Filed Aug. 5, 1971, Ser. No. 169,200
Int. Cl. E21b *7/12*
U.S. Cl. 166—.5 **19 Claims**



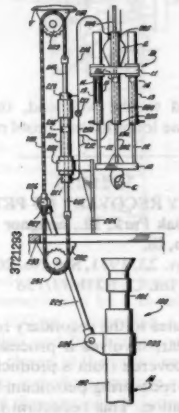
A liner installed in a deep water marine riser extending from a region near the floor of the ocean to a drilling vessel or platform floating in or positioned above the ocean, the lower portion of the liner being anchored in the lower portion of the marine riser, with the upper portion of the liner hanging or supported in the upper portion of the marine riser, the liner string between the anchoring and hanging portions being tensioned and maintained in tension.

3,721,293

COMPENSATING AND SENSING APPARATUS FOR WELL BORE DRILLING VESSELS

Arthur G. Ahlstone, Ventura, and Edward Larralde, Santa Barbara, both of Calif., assignors to Vetco Offshore Industries, Inc., Ventura, Calif.

Filed Feb. 16, 1971, Ser. No. 115,570
Int. Cl. E21b *19/08*
U.S. Cl. 166—.5 **19 Claims**



Apparatus automatically compensating for relative vertical movement between a hoisting or supporting mechanism and a load carried thereby, which load, for example, may be a running string connected to a drill bit used in drilling a subaqueous well bore, the mechanism supporting the running string being mounted on a floating vessel anchored over the well bore. The compensating apparatus includes a cylinder and piston device containing a hydraulic fluid exerting a lifting or tensioning force on the running string, or other load, the pressure on the hydraulic fluid being maintained generally constant despite relative axial movement between the cylinder and piston portions of the device that might result from heaving of the vessel due to wind and wave action, or the lowering of the running or drilling string as the bit drills the hole. To insure that the apparatus will closely follow the movement of the floating vessel, a motion sensing system is employed that exerts a force to move the cylinder and piston of the compensating apparatus with respect to each other a distance equal to the vertical movement of the floating vessel.

3,721,294

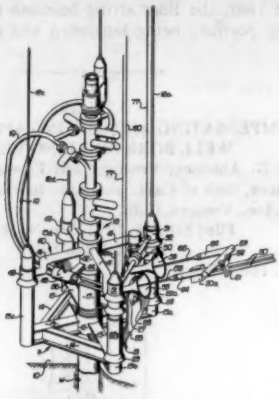
UNDERWATER PIPE CONNECTION APPARATUS

Bobby H. Nelson, Houston, Tex., assignor to Vetco Offshore Industries, Inc., Ventura, Calif.

Filed Jan. 12, 1971, Ser. No. 105,928
Int. Cl. E21b *43/01*
U.S. Cl. 166—.6 **15 Claims**

A flowline guide structure is lowered from a floating vessel along selected guide lines extending upwardly from the guide post of a previously installed standard guide structure suitably mounted at the upper end of a well bore drilled downwardly from the floor of an ocean or other body of water, the selected guide lines determining the direction in which flowlines are to extend, and which are to be secured to the flowline guide

structure and appropriately aligned with flowline loops extending from a Christmas tree lowered along the guide lines



and then connected to the wellhead, the flowlines being secured to the flowline loops in leak-proof relation.

3,721,295

SECONDARY RECOVERY OF PETROLEUM

Lawrence L. Bott, Oak Park, Ill., assignor to Nalco Chemical Company, Chicago, Ill.

Filed Nov. 23, 1971, Ser. No. 201,489
Int. Cl. E21b *33/138*
U.S. Cl. 166—295 **8 Claims**

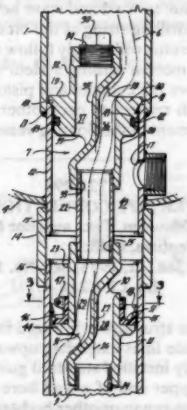
This invention relates to the secondary recovery of petroleum, and in particular, involves a process for reducing the amount of water recovered from a producing well in a water flooding process for recovering petroleum from a subterranean oil-bearing formation. This reduction in water is accomplished by introducing a water-in-oil emulsion which contains dispersed therein from 0.01 to 35 percent by weight of a finely-divided water-soluble vinyl addition polymer.

3,721,296

WELL SYSTEM WITH IMPROVED PITLESS ADAPTER ASSEMBLY

Howard A. Tubbs, 406 S. Elizabeth St., Whitewater, Wis. 53190

Filed Apr. 1, 1971, Ser. No. 130,109
Int. Cl. E21b *33/02*
U.S. Cl. 166—88 **5 Claims**



A well system which includes a water storage tank, a well casing extending through the tank and into the ground, a pump in the lower casing end and a water supply drop pipe between the pump and tank. The casing is divided into several parts by a coupling. A pair of packer bodies are hung within the casing with the coupling therebetween. The packer bodies include substantially identical cores with each core being divided into complementary adjacent passages by an S-shaped wall. Water and electrical conduit pass through the cores, and the conduit also passes through the tubular connector extending between the bodies. The packer bodies are sealed to the casing wall to form a central chamber so that water within the chamber pressurizes the inside of the coupling. The seal on the lower packer body is a generally cup-shaped ring.

3,721,297

METHOD FOR CLEANING WELLS

Robert D. Challacombe, 5583 Pebble Beach Lane, Yorba Linda, Calif.

Filed Aug. 10, 1970, Ser. No. 62,379
Int. Cl. E21b *37/00, 43/26*
U.S. Cl. 166—299 **12 Claims**

A combination of repeated mild explosions and a series of pressure pulsations provides both repetitive shock and repetitive sustained fluid pulsations. The shock is required to break up and loosen various formations and materials formed in the well casing perforations and interstices of surrounding formation. The pulsations achieve repeated flow of the well fluid back and forth through the casing perforations and surrounding formation to thereby remove particles of plugging material that are loosened by the shock waves. A series of explosive caps, explosive power of which is enhanced by surrounding layers of plastic sheet explosive, are individually interposed between a number of gas pulsation producing modules. Each module is arranged to effect burning of a combustible in a series of pulses to produce the desired fluctuating pressure pulses and fluid surging. The entire assembly of gas producing modules and explosive caps is interconnected in a string and arranged so that the burning or explosion of one element of the string will, itself, initiate the burning or explosion of the succeeding element, thus eliminating the need for multiple control lines for the desired sequential ignition.

3,721,298

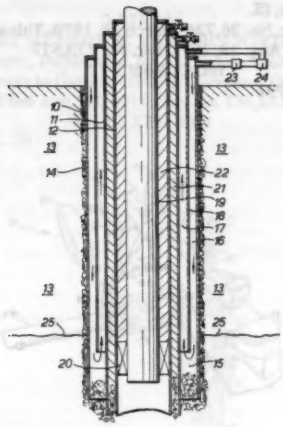
PERMAFROST OIL-PRODUCTION METHOD

William George Corbett, 104 Handside Lane, Welwyn Garden City, Hertfordshire, England, and Michael Ward Clegg, 3 Saville Gardens, Prior Road, Camberley, Surrey, England

Filed Oct. 6, 1970, Ser. No. 78,395
Claims priority, application Great Britain, Nov. 10, 1969, 54,891/69
Int. Cl. E21b *43/00*
U.S. Cl. 166—302 **1 Claim**

Hot oil is produced from a well passing through permafrost by circulating a cold fluid down an outer annulus

in contact with the permafrost and returning the fluid to the surface via an inner annulus in contact with the outer



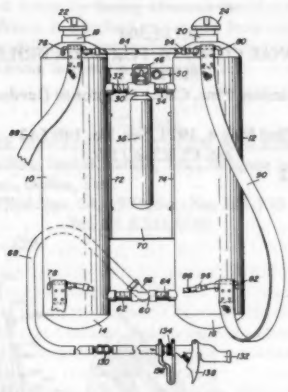
annulus and the production string. Preferably there is an insulation layer between the inner annulus and the production string.

3,721,299

DUAL DRY CHEMICAL FIRE EXTINGUISHER

Walter E. Roessler, Rio Piedras, Puerto Rico, assignor to Gulf Oil Corporation, Pittsburgh, Pa.

Filed May 3, 1971, Ser. No. 139,547
Int. Cl. A62c *13/00*
U.S. Cl. 169—31 P **4 Claims**



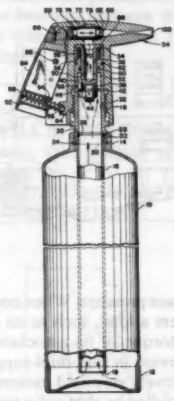
A portable chemical fire extinguisher is disclosed which comprises two containers, each carrying a dry chemical fire extinguishing powder, connected together to form a unitary, back-carried, extinguisher. The two containers feed a single discharge manifold so that they may be discharged through a single hose and pistol grip nozzle. A propellant gas cartridge is connected to the two containers through a common pressure manifold to provide equal pressure in the tanks, whereby both discharge at the same time. The pistol grip nozzle has a modified trigger which facilitates operation of the extinguisher.

3,721,300

AEROSOL FIRE EXTINGUISHER AND METHOD

James R. Becker, 2984 Essex Road, Cleveland Heights, Ohio, and Richard H. Furlow, 4701 Jefferson Street, Midland, Mich.

Filed Dec. 27, 1971, Ser. No. 212,439
Int. Cl. A62c *13/24*
U.S. Cl. 169—31 R **6 Claims**



There is provided an improved aerosol-type fire extinguisher which is characterized by a metallic bottle having a yield point of about 800 psi, a riser pipe, a coupler to which is secured the riser pipe and the bottle, refilling valve means which are normally closed at the outer extremity of the coupler, a nozzle means including separate valve means therein including an internal shoulder which during attachment of the nozzle to the assembly opens the refilling valve. The fire extinguishing composition contained therein is characterized, first, by its stability in the presence of aluminum metal and, secondly, by being a mixture of a tetrahalo-substituted methane including at least one atom each of chlorine, fluorine, and bromine, and a tetrahalogenated methane including atoms of only chlorine and fluorine, which composition is a solvent for an inert gas, e.g., CO_2. This composition when homogeneously blended together is then mixed with a sufficient quantity of inert gas under pressure, forming a solution therewith when maintained under super atmospheric pressure within the fire extinguisher, and far less demanding as to the strength of container than CO_2 gas extinguishers.

The novel method contemplates filling and refilling the fire extinguisher container by a process which includes blending the two halomethane components to form a homogeneous blend and then introducing carbon dioxide to the homogeneous blend under pressure or, alternatively, introducing the carbon dioxide into one of the tetrahaloalkanes first and then adding the other tetrahaloalkanes.

3,721,301

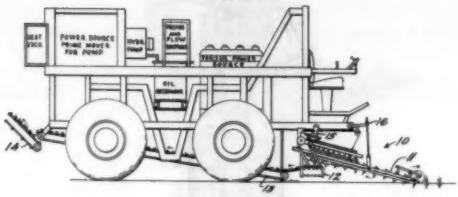
CONTROL SYSTEM FOR A MULTIPLE ROW CROP HARVESTING MACHINE

George E. Weasel, Jr., McClure, and Harold W. Weimer, Toledo, both of Ohio, assignors to Tem-Cole, Inc., McClure, Ohio

Continuation-in-part of Ser. No. 762,176, Sept. 16, 1968, Pat. No. 3,548,951. This application Sept. 21, 1970, Ser. No. 73,728
Int. Cl. A01d *25/04*
U.S. Cl. 171—61 **6 Claims**

A control system for a harvesting machine for the simultaneous harvesting of a plurality of plurality spaced-apart rows of crops. The machine includes a plurality of separate harvest-

ing mechanisms mechanically driven by a plurality of hydraulic fluid motors whose output torque is proportional to the pressure of the hydraulic fluid supplied thereto. A source of hydraulic fluid under a predetermined constant pressure is connected to the fluid motors by fluid supply and return lines to provide a closed hydraulic system with a pressure responsive bypass valve positioned in each of the supply lines and effective to bypass hydraulic fluid around the motors supplied by that line when the pressure on said valve exceeds said



predetermined constant pressure. When one of said harvesting mechanism encounters a load, such as an obstruction, which exceeds the output torque of its associated motor, the consequent pressure increase in said fluid supply line will open a bypass valve to effectively stop said motors and their harvesting mechanisms controlled by that valve until said obstruction is removed. The machine may further include an improved remotely operable override means for opening said bypass valve.

3,721,302

DRAFT LINK SWAY LIMITING DEVICE

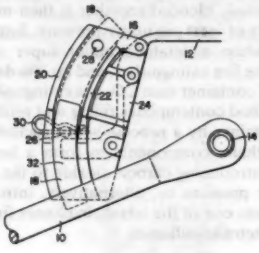
Josef Buchmuller, and Otto Hartlieb, both of Mannheim, Germany, assignors to Deere & Company, Moline, Ill.

Filed March 13, 1972, Ser. No. 234,115

Claims priority, application Germany, Sept. 16, 1971, G 71 35 201.7

Int. Cl. A01b *59/043*

U.S. Cl. 172—450 **9 Claims**



An arcuate-shaped channel member is secured to the side of the tractor with its legs projecting toward and for engagement with the tractor draft link. The legs of the channel member prevent lateral movement of the draft link when in the upper position and permit limited lateral movement of the draft link when in the lower position. An arcuate-shaped guide member between the legs of the channel member is movable between an upper position in which its outer surface is in alignment with the legs of the channel member and a lower position in which its outer surface projects outwardly beyond the legs of the channel member to engage and prevent lateral movement of the draft link when the draft link is in the lower position.

3,721,303

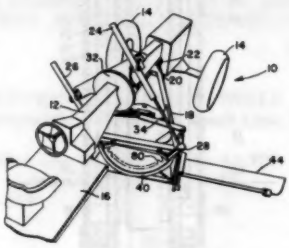
POWER TRANSMISSION DEVICE FOR ROTATING A GRADER CIRCLE

Paul Edmund Hanser, Moline, Ill., assignor to Deere & Company, Moline, Ill.

Division of Ser. No. 20,726, March 18, 1970. This application Aug. 20, 1971, Ser. No. 173,577

Int. Cl. E02f *3/12*

U.S. Cl. 172—792 **9 Claims**



A grader circle has an annular internal gear which is meshed with a gear carried at the bottom of a crank shaft. A pair of double-acting hydraulic actuators have their piston rods connected to the crank pin of the crank shaft and the circle is driven by alternate extensions and retractions of the piston rods. The cylinders of the actuators are swivelly connected to the circle-carrying frame by means of pin structures which are fixed to and swivel with the cylinders as the piston rods are extended and retracted. The pin structures terminate in cams which engage shiftable valve stems of a reversing valve to automatically reverse the flow of fluid to the actuators when the piston rods of the actuators reach the ends of their strokes.

3,721,304

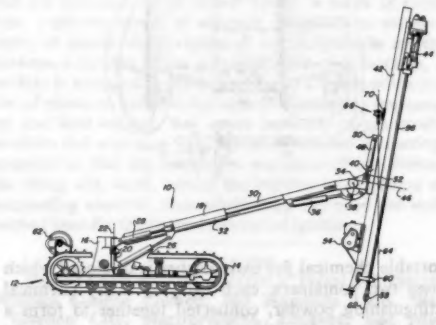
DIRECTIONAL CONTROL FOR ROCK DRILL FEED SUPPORT

Laurence B. Hanson, Pine, Colo., assignor to Gardner-Denver, Quincy, Ill.

Filed May 4, 1971, Ser. No. 140,142

Int. Cl. E21c *11/02*

U.S. Cl. 173—2 **9 Claims**



A direction sensing unit and control circuit for prepositioning a rock drill feed support to provide for drilling a series of parallel holes. The direction sensing unit is mounted on the feed support and includes a pivotally mounted weight responsive to gravitational force acting thereon to actuate a plurality of pneumatic valves to provide pressure signals. The control circuit includes pneumatically operated control valves which,

in response to receiving pneumatic pressure signals from the sensing unit, are operable to valve hydraulic fluid to and from hydraulic positioning cylinders connected to the feed support.

3,721,305

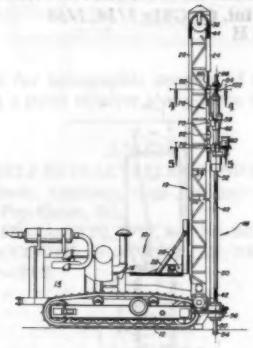
SUPPORT MEANS FOR MAST MOUNTED DRILL

James R. Mayer, Dallas, and Joe D. Tipton, Garland, both of Tex., assignors to Gardner-Denver Company, Quincy, Ill.

Filed Aug. 30, 1971, Ser. No. 176,052

Int. Cl. E21c *5/06*

U.S. Cl. 173—20 **8 Claims**



A mast mounted percussion rock drill having a force transmitting frame which provides for a feed force to be exerted on the drill and drill string in a direction which is coaxial with the longitudinal axis of the drill string. The force transmitting frame is adapted to be slidably retained in a mast structure having spaced inwardly facing channel members. The force transmitting frame is attached to a single feed chain centrally located on the drill mast and includes a hydraulic force sensor for directly sensing the feed force on the drill.

3,721,306

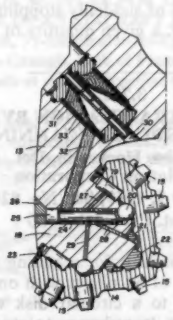
PRESSURE EQUALIZING SYSTEM FOR ROCK BITS

Raymond Watkins Sartor, Dallas, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Nov. 24, 1971, Ser. No. 201,733

Int. Cl. E21b *9/10*

U.S. Cl. 175—228 **10 Claims**



A cone cutter is rotatably mounted upon a bearing shaft extending from the arm of a sealed bearing rotary rock bit. An open ended conduit extends through the arm of the bit and a lubricant reservoir is positioned within the arm of the bit encircling the conduit. A flexible diaphragm is positioned between the lubricant reservoir and the conduit to provide pressure equalization of lubricant in the lubricant reservoir and fluid in the well bore. Ports in the wall of the conduit transmit pressure from the fluid in the well bore to the flexible diaphragm. Movement of the flexible diaphragm is limited by the wall of the conduit in one direction and by a perforated cylindrical canister mounted in the lubricant reservoir in the opposite direction. A lubricant passageway extends from the lubricant reservoir to bearings between the cone cutter and the bearing shaft to transmit lubricant from the lubricant reservoir to the bearings.

3,721,307

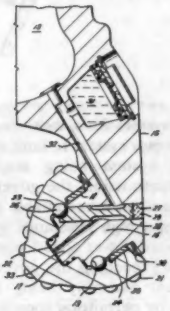
DRILL BIT BEARINGS

Terry H. Mayo, Houston, Tex., assignor to G. W. Murphy Industries, Inc., Houston, Tex.

Filed April 27, 1971, Ser. No. 137,875

Int. Cl. E21b *9/02*

U.S. Cl. 175—372 **3 Claims**



A drill bit bearing including a floating beryllium copper bushing.

3,721,308

SNOWMOBILE SUSPENSION SYSTEM

Ronald I. Brandli, and James R. Gjovik, both of Roseau, Minn., assignors to Textron Inc., Providence, R.I.

Filed Feb. 4, 1971, Ser. No. 112,581

Int. Cl. B62m *27/02*

U.S. Cl. 180—5 R **10 Claims**

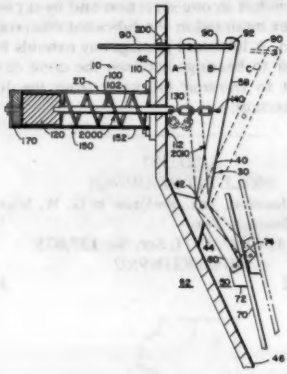
A snowmobile slide rail suspension system is shown in which the suspension frame, having spaced side frame members each formed from a pair of metal stampings, is positioned between the upper and lower runs of the drive track. The snowmobile body is supported on the frame by pivotable front and rear arms. A pair of torsion springs have their central portions and one end portion of each secured to the read arms and have their other end portions carried by spring support members extending rearwardly from the front arms at their pivotal connection with the frame, to thereby bias the front and rear arms away from the frame.

3,721,309

SPEED CONTROL SYSTEM FOR MOTOR VEHICLES

Fred A. Donaldson, 2068 South Street, Blair, Nebr.

Filed July 13, 1970, Ser. No. 54,424
Int. Cl. B60k *31/00*
U.S. Cl. 180—105 R **5 Claims**



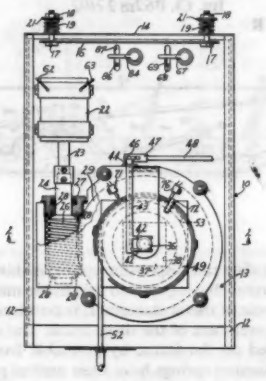
A speed control system for a motor vehicle comprising in combination; a governor system to limit the speed of the vehicle, the governor system being responsive to rotation preferably at the transmission, the governed speed of travel being pre-settable, and an overcomable high speed deterrant assembly comprising a high resistance spring urging the accelerator pedal toward lower speed positions only at times when the vehicle is exceeding the governed speed, and the high speed deterrant assembly being correlated with the governor for safety by permitting speeds free of extra deterrant forces on the accelerator pedal up to a maximum governor controlled vehicle speed which latter can be exceeded temporarily in emergency by further accelerator pedal depression for over-riding the governor.

3,721,310

SAFETY BRAKE SYSTEM FOR VEHICLES

Dalton A. Thomas, Route One, P.O. Box 97, Alpine, Ala.

Filed Dec. 16, 1971, Ser. No. 208,678
Int. Cl. B60t *7/12*
U.S. Cl. 180—111 **10 Claims**



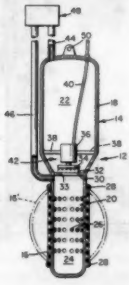
A frame movable to a first position when brakes are applied and a second position when brakes are released with resilient means urging the frame toward said second position. A reversible power unit and winch is carried by the frame and a circuit connects the power unit to a source of power to drive the winch in a direction to apply brakes and release brakes selectively whereupon the frame moves to said first position and said second position, respectively. A door actuated switch is in series with said circuit and a limit switch interrupts said circuit upon movement of said frame to said first position.

3,721,311

MARINE SEISMIC SOURCE EMPLOYING THE WATER-HAMMER EFFECT

Lewis Morton Mott-Smith, Houston, Tex., assignor to Mandrel Industries, Inc., Houston, Tex.

Filed Mar. 11, 1970, Ser. No. 18,418
Int. Cl. G01v *1/14, 1/38*
U.S. Cl. 181—.5 H **16 Claims**



Apparatus for generating a seismic signal in a fluid medium wherein a member such as a flexible diaphragm, inflatable elastic member, piston, etc., is placed in a first or initial position relatively slowly by a pneumatic, hydraulic, electrical, mechanical etc., system, and upon firing is allowed to move rapidly to a second position, where it is abruptly stopped. That is, the member provides for the slow creation of a selected volume within the fluid medium which volume is then allowed to shrink rapidly whereupon its motion is suddenly arrested. The hydrostatic pressure of the fluid medium causes the medium to follow the movement of the member, whereby abruptly stopping the member likewise suddenly stops the fluid movement to generate, in turn, a single high pressure pulse due to the water-hammer effect. Thus, the invention is concerned with generating a single seismic pulse by the more efficient process of suddenly stopping, rather than by suddenly accelerating, a given quantity of the surrounding fluid medium.

3,721,312

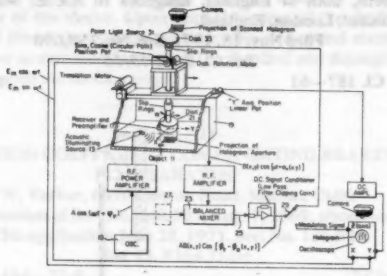
RADIATION TRANSLATION BY ROTARY TRANSDUCER SCANNING

Daniel S. St. John, Hockessin, Del., assignor to Holotron Corporation

Filed May 1, 1969, Ser. No. 820,862
Int. Cl. G01h *9/00*
U.S. Cl. 181—.5 R **33 Claims**

A method and apparatus for scanning a radiation field carrying information of an object with one or more point transducers attached to a circular disk which is rotated for the transducer or transducers to scan out a desired surface of the radiation field. The specific systems disclosed translate acoustic energy into light energy having a corresponding wavefront, thereby to give a visual image of the ultrasonic wavefront scanned. Both holographic

and non-holographic imaging systems utilizing various forms of the rotary point transducer scanner are disclosed.



A technique for holographic imaging of a moving object by scanning a point receiver along a line is also disclosed.

3,721,313

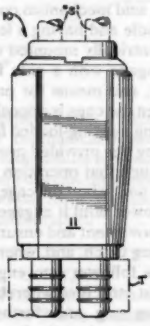
SELF RETRACTABLE SOUND PLUG

Joseph Machado, Attleboro, Mass., assignor to Avid Corporation, East Providence, R.I.

Filed April 20, 1972, Ser. No. 245,820

Int. Cl. G10k *13/00*; H04r *1/28*; A61b *7/02*

U.S. Cl. 181—31 R **2 Claims**



A self retractable sound plug for use in association with a transducer, generally located in the arm of an airpassenger seat.

3,721,314

SILENCER OR MUFFLER FOR THE COMPOSITE NOZZLE OF AN AIRCRAFT JET ENGINE

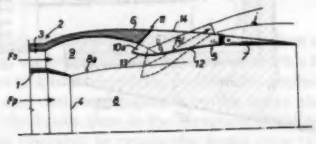
Rene Gerard Hoch, 77-Dammarie-les-Lys, and Louis Francois Jumelle, 91-Ris-Orangis, both of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, Paris, France

Filed Jan. 19, 1972, Ser. No. 219,108

Claims priority, application France, Jan. 20, 1971, 7101797

Int. Cl. B64d *33/06*; F01n *1/14*

U.S. Cl. 181—33 HC **10 Claims**



A silencer or muffler device for a jet engine nozzle efflux system, of the type which includes a primary nozzle which emits into the divergent section of a secondary nozzle, formed by the inner wall of an afterbody with a streamlined outer wall, a primary jet of hot gases surrounded by a flow of secondary air; said device comprising a plurality of scoop-like members adapted to be moved between an active position in which they penetrate into the jet, as regards their upstream end, in the manner of scoops so as to bleed off portions of the jet of hot gases and of the flow of secondary air and discharge them in to the ambient atmosphere upstream of the exit of the divergent section by way of openings in the afterbody, so forming fractional jets around the central jet which is formed by the nonbled portion of the primary jet and of the secondary flow, and an inactive position in which they fit into the said openings and reconstitute the continuity of the wall of the divergent section.

3,721,315

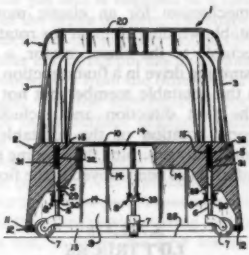
STEP AND STOOL AND CASTER MOUNTING THEREFOR

Norvin J. Wehner, Kansas City, Mo., assignor to Cramer Industries, Inc., Kansas City, Kans.

Filed June 30, 1971, Ser. No. 158,394

Int. Cl. A47c *3/18*, *9/00*

U.S. Cl. 182—15 **12 Claims**



A step and stool and caster mounting therefor includes a base having portions engageable with legs of a stool portion for supporting and removably securing same thereon and members for movably receiving one end of each of a plurality of respective caster pintles therein and clips engageable with the caster pintles and the pintle receiving members for retaining the casters mounted on the base.

3,721,316

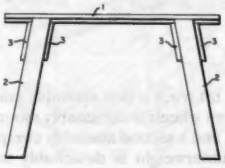
SAWHORSE

Alvin E. Greenplate, Wilmington, Del., assignor to G-P Industries, Inc., Wilmington, Del.

Filed July 22, 1971, Ser. No. 165,111

Int. Cl. E04g *1/32*

U.S. Cl. 182—181 **7 Claims**



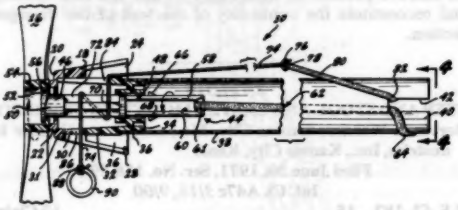
A sawhorse comprising an elongated horizontal wood member being dovetailed along each of its two lower edges and slidably mounted within the two cavities formed by two pairs of convergingly related legs.

3,721,317

RETRACTABLE WINDING MECHANISM FOR ELASTIC MOTORS

Derek J. Gay, Palos Verdes Peninsula, Calif., and William H. Smedley, Garden Grove, Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed June 3, 1971, Ser. No. 149,427
Int. Cl. F03g 1/08; A63h 27/00
U.S. Cl. 185—39 **2 Claims**



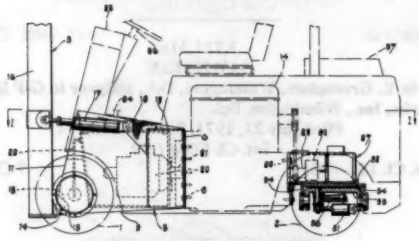
A winding mechanism for an elastic motor includes a manually actuatable winding element for rotating a rotatable member connectable to the elastic motor, a one-way drive device for transmitting drive in a first direction from the winding element to the rotatable member but not in the reverse direction to the first direction and including means for preventing reverse rotation of the rotatable member and means for automatically returning the winding element into its initial position after it has been moved in the first direction.

3,721,318

LIFT TRUCKS

John Warrender, Franklin, Coventry, England, assignor to Total (Power Hydraulics) Limited, Glamorgan, England

Filed March 19, 1971, Ser. No. 126,157
Int. Cl. B66f 9/06
U.S. Cl. 187—9 **4 Claims**



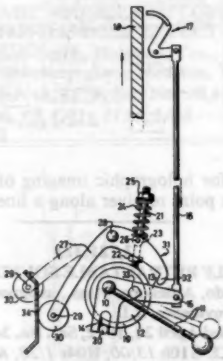
In an industrial lift truck a first assembly comprising a mast structure and driven wheels is detachably mounted on one end of a prime mover, and a second assembly comprising steerable wheels and a counterweight is detachably mounted on the other end of the prime mover. The prime mover thus acts as part of a chassis of the truck. The first assembly comprises a tank which is attached to the prime mover and on which the mast structure and driven wheels are mounted. The tank thus acts as a further part of a chassis. The driven wheels are coupled with the prime mover by an hydrostatic transmission which includes a pump disposed within the tank, the latter acting as a reservoir for the pump.

3,721,319

HOISTS

Richard John Hall, Bexley Heath, and Alan John Shalders, Tolworth, both of England, assignors to A.C.E. Machinery Limited, London, England

Filed Nov. 15, 1971, Ser. No. 198,690
Int. Cl. B66b 13/16
U.S. Cl. 187—61 **6 Claims**



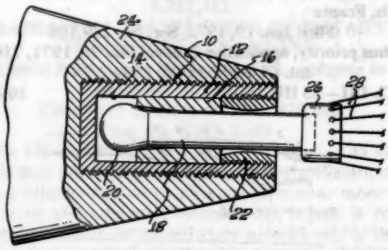
A gate locking mechanism for the cage of a hoist having a plurality of landings, said mechanism comprising a shaft carrying an operating handle and having a lever pivotally mounted thereon, a cam eccentrically mounted on the shaft, a locking catch adapted to engage with a gate for the cage and connected to said lever, and means for preventing operation of the catch except when the cage is opposite one of the landings, said means comprising a spring-loaded follower adapted to cooperate with a locking peg provided provided on the lever, the arrangement being such that operation of the handle is effective to pivot the cam and, when the cage is not opposite a landing, to pivot the follower until it engages with the locking peg preventing further movement and ensuring that the gate is still engaged by the locking catch, and, when the cage is opposite a landing, to force the follower into engagement with a ramp provided on the hoist structure whereby the follower is held clear of the locking peg and further movement of the mechanism is effective to pivot the lever and hence move the locking catch clear of the gate.

3,721,320

ENERGY ABSORPTION APPARATUS

Joseph Hirsch, 12272 Enramada Dr., Santa Ana, Calif.

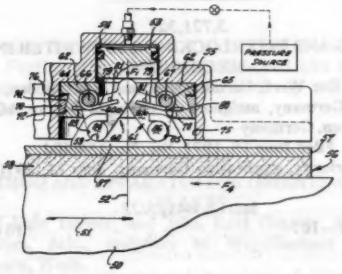
Filed Aug. 26, 1972, Ser. No. 175,240
Int. Cl. F16f 7/12
U.S. Cl. 188—1 C **7 Claims**



An energy absorption apparatus which includes a body having a cylindrical bore; a soft ductile metallic sleeve mounted in the cylindrical bore; a cylindrical shaft mounted in the sleeve and having an enlarged hard metallic mandrel portion which is

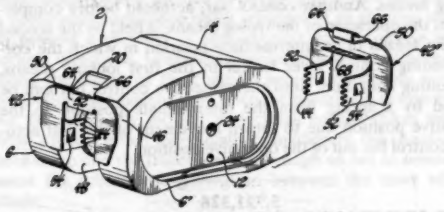
capable of drawing through the soft metallic sleeve; and a annular die mounted in the cylindrical bore and having an internal diameter which is larger than the external diameter of the cylindrical portion of the shaft but less than the external diameter of the sleeve. Upon impact loading of the shaft the mandrel draws through the soft metallic sleeve and metal of the sleeve as extruded forward of the mandrel and through the die to absorb the shock energy.

3,721,321
FRICTION COEFFICIENT COMPENSATING BRAKING APPARATUS
Gordon W. Yarber, 6070 Canyon Road, Malibu, Calif.
Continuation of Ser. No. 848,307, Aug. 7, 1969, abandoned.
This application June 25, 1971, Ser. No. 156,929
Int. Cl. F16d *55/26*
U.S. Cl. 188—72.6 **7 Claims**



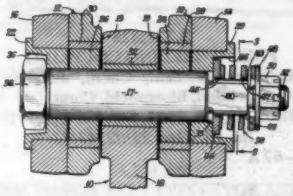
The invention concerns friction braking apparatus incorporating provision for mechanical force feedback proportional to torque, and which results in a near constant relationship or transfer function between the force applied to result in brake lining pressure on the rotor, and the developed braking force which results in deceleration.

3,721,322
SELF-COMPENSATING DISC BRAKE APPARATUS
Tom H. Thompson, 2800 North Atlantic Avenue, Daytona Beach, Fla.
Filed May 17, 1971, Ser. No. 144,176
Int. Cl. F16d *65/54*
U.S. Cl. 188—196 P **26 Claims**



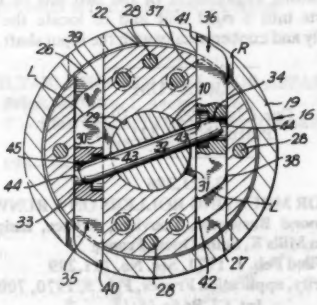
Brake apparatus including a housing, a brake shoe mounted on the housing, the brake shoe being movable from a brake relieved position to a brake applying position for applying braking pressure, and means engageable by the brake shoe upon movement of the brake shoe in the direction of the brake applying position operable to return the brake shoe to a brake relieved position in which the braking surface of the brake shoe has a fixed location with respect to the brake applying position regardless of brake wear and previous elastic distortion of the housing.

3,721,323
CLAMPING DEVICE
Michael Henry Kraus, Jr., Hammond, Ind., assignor to Amsted Industries Incorporated, Chicago, Ill.
Filed May 19, 1971, Ser. No. 144,768
Int. Cl. F16d *65/06*
U.S. Cl. 188—206 R **4 Claims**



A clamping device is provided for a brake rigging having spaced brake hangers separated by a brake head. A pin is located in a passage in the brake hangers and brake head and is used as a pivotal point to provide movement between the head and the hangers. A hexagonal shaped nut is threaded on to one end of the pin and is engaged in a hexagonal shaped opening in one of the brake hangers. The shape of the nut and the opening is such that the nut may not be rotated within the opening. The other end of the pin has an asymmetrical portion which projects outwardly from the other brake hanger. A first washer is engaged with the asymmetrical portion and has a hexagonal shape outer surface engaged within a hexagonal shaped opening in the hanger. The washer-pin-opening arrangement is such that the washer may not be rotated relative to the pin or the opening. A compression spring encircles the asymmetrical portion of the pin. A second washer engages the outer portion of the compression spring and is used, in combination with a nut, to force the first washer into the hexagonal shaped opening and hold the pin relative to the brake hangers.

3,721,324
REVERSIBLE CLUTCH MECHANISM
Edward E. Schweizer, New Rochelle, N.Y., assignor to Transi-Coil Corporation, Hasbrouck Heights, N.J.
Filed Dec. 1, 1971, Ser. No. 203,553
Int. Cl. F16d *11/06, 21/02*
U.S. Cl. 192—48.91 **8 Claims**



An improved reversible clutch mechanism of the type in which one or the other of two drive mechanisms is coupled to drive shaft selectively, in accordance with the direction of rotation of the shaft. The clutch includes a pair of annular shells independently rotatably mounted on the drive shaft and at least one pawl disposed in the space provided between the shells.

The pawl includes first and second drive teeth which are offset in the direction of the axis of the shaft so that one said tooth is in proximity to one shell and the other in proximity to the other shell.

A cross pin mounted on the shaft is pivotally connected to the pawl, to shift the pawl radially in one or another direction, depending upon the direction of rotation of the shaft, thereby to couple one or the other of the teeth of the pawl to one or the other of the shells.

3,721,325

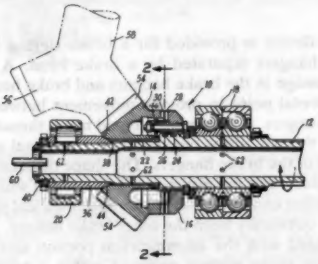
FREE WHEELING COUPLING

Nelson R. Richmond, Enfield, Conn., assignor to Kaman Aerospace Corporation, Bloomfield, Conn.

Filed Aug. 18, 1971, Ser. No. 172,771

Int. Cl. F16d *23/02, 41/12*

U.S. Cl. 192—67 A **10 Claims**



A rotary coupling for connecting a driven part to a source of power transmits power in one direction only and permits the driven part to free wheel when the speed of the output member of the coupling is greater than that of the input member. The coupling includes an input member in the form of a shaft, and an output member and a coupling member both mounted on the input shaft and having co-engageable sets of axially facing, radially extending clutch teeth. A helical spline connected between the coupling member and the input shaft and a ratchet mechanism between the coupling member and the output member effects the engagement and disengagement of the teeth by moving the coupling member axially toward and away from the output member. The output member is backed up by a conical seating surface on the input shaft against which it is urged by the coupling member during power transmitting engagement of the two sets of teeth to form the parts into a rigid unit and to locate the output member axially and concentrically with the input shaft.

ERRATUM

For Class 192—70.19 see:
Patent No. 3,721,794

3,721,326

DEVICE FOR MOUNTING ROLLERS ON A RUNWAY

Christian Edmond Bussienne, Louviers, France, assignor to Construction Mills K, Saint Ouen, France

Filed Feb. 1, 1971, Ser. No. 111,299

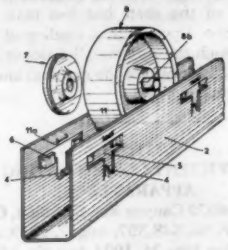
Claims priority, application France, Feb. 5, 1970, 7004008

Int. Cl. B65g *13/11*

U.S. Cl. 193—35 R **1 Claim**

Device for rapidly assembling a multiplicity of rollers with a section member of a runway which also affords an improved running of the rollers.

It comprises on the inner faces of the flanges of a U-section member tabs constituting clips which grip the periphery of a side-member bearing. The bearing has a plane face which lies flat against the inner face of the flange and a central bore in which the spindle end portion of the roller is mounted.



An application of the device is in conveyors and storage systems in which objects travel along runways.

3,721,327

STORING AND INTERLOCKING TYPEWRITER INPUT MECHANISM

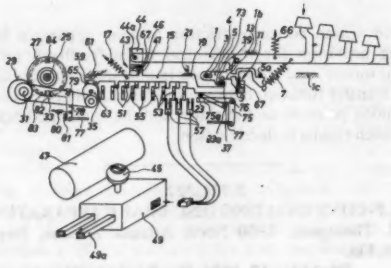
Chien Van Der Werf, Carolinensiel, and Rolf Theilen, Sande, both of Germany, assignors to Olympia Werke AG, Wilhelmshaven, Germany

Filed June 18, 1971, Ser. No. 154,404

Claims priority, application Germany, July 11, 1970, P 20 34 583.9

Int. Cl. B41j *5/22*

U.S. Cl. 197—107 **10 Claims**



Keys of a typewriter actuate control levers which cooperate with first locking means so that only one key can be actuated at a time. The control levers actuate control bars which cooperate with second locking means so that only one control bar at a time can move to an operative position for actuating typing means. Another control bar, actuated before completion of the operation of the typing means, is held by the second locking means in an intermediate position in which the corresponding control lever is still in the first locking means, preventing actuation, until the respective control bar can be moved by a spring from the intermediate position to the operative position due to return movement of the first actuated control bar out of the operative position.

3,721,328

LID UNSCRAMBLER HAVING ROTATIONALLY RECIPROCATING GATE

William G. Drew, % Automation Systems, Inc., 360 Amherst St., Nashua, N.H.

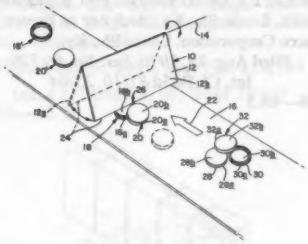
Filed Aug. 21, 1970, Ser. No. 65,870

Int. Cl. B65g *47/22*

U.S. Cl. 198—29 **11 Claims**

A lid unscrambler has a gate above a lid conveyer and rotationally reciprocating back and forth along the direction of the conveyer path to interfere with the passage of stacked or layered lids, i.e. lids that are resting at least in part on another lid and hence are not lying flat

on the conveyer. The angle through which the gate reciprocates is sufficiently small and the rate of reciprocation sufficiently fast, so that the gate at all times interferes with the passage of a lid raised above the conveyer. Further, the gate subjects stacked and layered lids to unscrambling forces directed both up and down the conveyer.



3,721,329

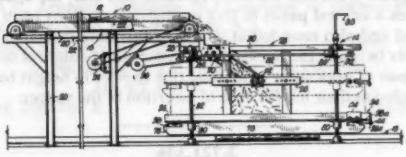
METHOD AND APPARATUS FOR ORIENTING WOOD FLAKES

Harold Dale Turner, and John Karl Fletcher, both of Hot Springs, Ark., assignors to Weyerhaeuser Company, Tacoma, Wash.

Continuation of Ser. No. 13,993, Feb. 25, 1970, abandoned. This application Nov. 22, 1971, Ser. No. 201,221

Int. Cl. B65g *47/00*

U.S. Cl. 198—33 R **7 Claims**



A machine for aligning elongated wood flakes with their longitudinal axes in substantial parallelism to one another has a continuous, serpentine chain arranged at an aligning station to present a plurality of spaced-apart rows movable in alternate directions. Upstanding projections are equally spaced along the length of the chain to present oppositely moving projections in adjacent rows when the machine is in operation. As the oppositely moving projections engage flakes issuing from a feeder either individually or in clusters, the clusters are broken up and the flakes rotated through an arc to orient the same for subsequent gravitation between the rows of the chain.

3,721,330

ARTICLE TIMING AND FEEDING MECHANISM

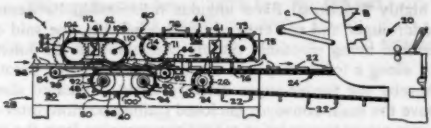
Donald C. Crawford, and Michael R. Nack, both of Green Bay, Wis., assignors to FMC Corporation, San Jose, Calif.

Filed Feb. 8, 1971, Ser. No. 113,417

Int. Cl. B65g *47/26*

U.S. Cl. 198—34 **9 Claims**

The disclosure concerns apparatus for reorienting a file of abutting articles into precisely positioned longitudinally spaced relation and for feeding the articles in exact timed relation to a processing machine, and operates by the interaction of plural chain conveyors with the articles, first to displace the leading article so that it has an accessible surface, and then to engage said surface and convey the article forwardly away from the succeeding articles.



3,721,331

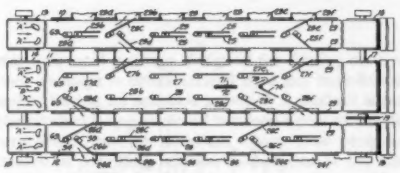
SIDE DISCHARGE BELT CONVEYOR ASSEMBLY

Franklin K. Holbrook, Whittier, and Donn J. Rickard, Glendora, both of Calif., assignors to Brown International Corporation, Covina, Calif.

Filed Oct. 23, 1970, Ser. No. 83,366

Int. Cl. B65g *15/00, 47/26*

U.S. Cl. 198—66 **7 Claims**



A side discharge belt conveyor assembly for fragile articles such as grapefruit sections employs three flat parallel conveyor belts all moving in the same direction, and having lateral spaces between adjacent side edges. Diverter blades are pivotally supported in close proximity to the upper surfaces of the belts in order to sweep the fragile articles laterally off all the side edges of the belts at predetermined locations, thereby minimizing the extent of required lateral travel of the fragile articles. Two oppositely-movable diverter blades above each side belt are connected to one diverter blade above a side portion of the wide center belt for simultaneous movement in unison between inoperative longitudinal positions and operative slanted positions. A deflector and additional pivoted blades are provided for diverting broken grapefruit sections from the central portion of the wide center belt to transverse discharge chutes at predetermined locations.

3,721,332

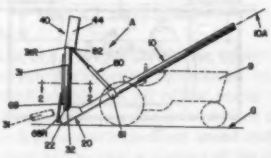
TILTABLE HOPPER ELEVATOR APPARATUS

Cecil A. Brink, RFD No. 1, Archer, Nebr.

Filed Feb. 8, 1972, Ser. No. 224,567

Int. Cl. B65g *37/00*

U.S. Cl. 198—94 **8 Claims**



There is provided elevator apparatus of the kind for transferring grain or other flowable solids material commencing from a rearwardly trailing hopper tiltably positionable at

ground level and thence progressively forwardly through: a feeder-auger conveyor, a hollow junction-box enclosing the rearwardly trailing portion of an independently powered main-conveyor, and ultimately to a solids depository. Several noteworthy features of the elevator apparatus herein include: a highly functional fixed angular relationship between the feeder-auger and the entire hopper assembly, the said combination being pivotably tiltably connected to the junction-box along a loftily disposed transversely extending pivot-axis whereby the feeder-auger delivery spout is located directly above the main-conveyor enclosed trailing portion; inter-conveyors power transmission means commencing from the main-conveyor externally of the junction-box and including universal joint means whereby the power transmission is effective through a range of feeder-auger tilted positions; and means for remotely tilting the feeder-auger and hopper to a selectable degree about said pivot-axis.

3,721,333

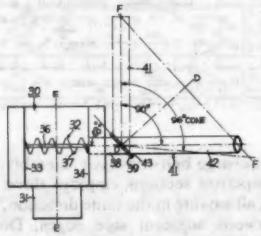
COMBINE GRAIN BIN UNLOADER

Jerry C. Boone, Independence, Mo., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed June 9, 1971, Ser. No. 151,384

Int. Cl. B65g *41/00*

U.S. Cl. 198—119 **1 Claim**



This disclosure relates to a power operated swingable auger conveyer which can be moved from operative discharge position conveyer at right angles to the vehicle supporting the conveyor to an inoperative discharge wherein the conveyer lies alongside the vehicle.

3,721,334

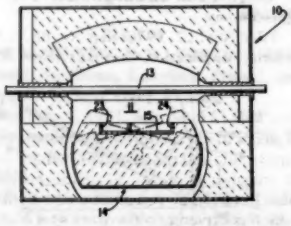
ROCKING HEARTH FURNACE

Alexander J. Jarema, River Forest, Ill., assignor to Solar Basic Industries Inc., Milwaukee, Wis.

Filed April 15, 1971, Ser. No. 134,225

Int. Cl. F27b *9/14*

U.S. Cl. 198—218 **5 Claims**



A hearth in a heat processing furnace has a plurality of angularly disposed baffles arranged in alternating overlapping relationship extending longitudinally on the upper surface thereof. The hearth is mounted for oscillating movement about a longitudinal axis so that periodic rocking of the hearth will advance articles along its upper surface by the sliding or rolling of the articles back and forth between alternate baffles.

3,721,335

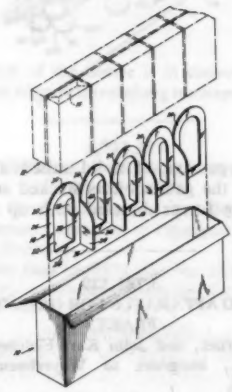
CIGARETTE CARTON WITH PACK SEPARATOR

Carl C. Grant, Louisville, Ky., assignor to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Filed Aug. 24, 1970, Ser. No. 66,320

Int. Cl. B65d *85/10, 25/04*

U.S. Cl. 206—48.5 **3 Claims**



A cigarette pack spacer is provided for spacing and protecting smaller than standard size cigarette packs in a standard carton. The spacer is in the form of a molded plastic insert extending along the center of the carton separating the two adjacent rows of five packs each and also the adjacent packs of each row from one another. Towards this end, the spacer includes a central panel of five contiguous sections each being cored and also rounded at its top to facilitate insertion of the spacer between the packs. At the juncture of adjacent sections is a pair of oppositely extending ribs shorter in height but also rounded at their top for ease of insertion of the spacer.

3,721,336

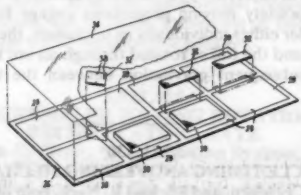
EASY OPENING PACKAGES

James V. Hannon, New Britain, Conn., assignor to Diversified Packaging Incorporated, Kensington, Conn.

Filed Sept. 4, 1970, Ser. No. 69,671

Int. Cl. B65d *73/00*

U.S. Cl. 206—56 AB **8 Claims**



A package comprises a base member having an article disposed on one surface thereof with a film of thermoplastic material covering the article and bonded to the surface of the base member thereabout. A tab of material that is nonadherent to the base member and adherent to the film is interposed therebetween at an edge of the package, to provide an

integral package that is readily opened when desired by pulling the tab towards the article to separate the film from the base member.

3,721,337

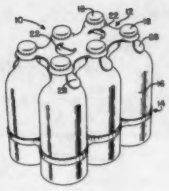
QUICK OPENING CONTAINER PACKAGE

Leonard C. Braun, Elk Grove Village, and M. Julius Klygis, Evergreen Park, Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.

Filed Feb. 19, 1971, Ser. No. 116,783

Int. Cl. B65d *71/00*; B66f *19/00*

U.S. Cl. 206—65 E 5 Claims



A container package including a plastic sheet carrier device is provided for retaining and transporting a plurality of similarly configured containers mounted and held within the carrier device, there further being combined with the carrier device a plurality of certain finger engaging tab means which inherently facilitate the separation and removal of containers from the container package.

3,721,338

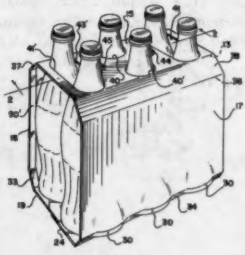
BOTTLE CARRIER PACKAGE

Edwin L. Arneson, Hillsdale, N.J., assignor to Federal Paper Board Company, Inc., Montvale, N.J.

Continuation-in-part of Ser. No. 82,300, Oct. 20, 1970. This application Jan. 11, 1971, Ser. No. 105,186

Int. Cl. B65d *75/00*, *85/62*

U.S. Cl. 206—65 E 3 Claims



A wraparound or sleeve-type container or carrier for bottled goods which is formed of a single blank and wrapped around a cluster of bottles arranged in double row formation with the ends of the blank adapted to be connected beneath the cluster of bottles and the blank having infolding edge reinforcing panels and finger holes which are reinforced by infolding panels taken from the top portion of the package so as to leave apertures through which the tops of pairs of the bottles project.

3,721,339

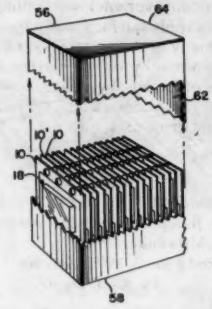
BLISTER CARD PACKAGE

Anthony W. Seyer, New Canaan, Conn., assignor to Warner-Lambert Pharmaceutical Company, Morris Plains, N.J.

Division of Ser. No. 869,012, Oct. 2, 1969, Pat. No. 3,621,996. This application July 1, 1971, Ser. No. 158,841

Int. Cl. B65d *5/54*, *77/04*

U.S. Cl. 206—65 R 3 Claims



A blister-type card package designed for display on a peg rack, which package is characterized by a flat base-forming card member having an aperture in which a product is positioned, the product being enclosed between a pair of tray-like transparent blister-forming members which have peripheral flanges sealed in overlying relation to portions of the base-forming card which extend about the aperture, the one blister member being seated in the aperture so that a portion of the product projects beyond the back face of the card and the other blister member covering a portion of the product which projects beyond the front face of the card. The packages are supplied for mounting on a peg rack with the product accommodating apertures in alternate packages being offset so that the projecting front and back portions of the product in adjacent packages are in non-aligned relation when hung on a peg, enabling a degree of nesting which results in a greater number of packages being accommodated on a peg, and also enabling a plurality of the packages to be packed in nested relation in a shipping container with provision for opening the container so that the packages may be readily placed as a group on the peg rack.

3,721,340

METHOD AND APPARATUS FOR TRANSPORTING CIGARETTE PACKS OR THE LIKE

Friedel Kruse, Hamburg; Gunter Wahle, Reinbeck; Otto Erdmann, Hamburg, and Willy Rudszinat, Dassendorf, all of Germany, assignors to Hanni-Werk Korber & Co. KG, Hamburg, Germany

Filed Nov. 12, 1970, Ser. No. 88,723

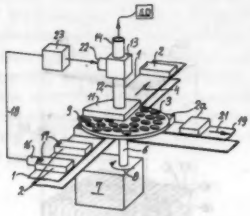
Claims priority, application Germany, Nov. 22, 1969, P 19 58 738.3

Int. Cl. B07c *5/342*

U.S. Cl. 209—74 R 20 Claims

Cigarette packs are transported by the upper stretch of a first belt to move into the range of a pneumatic overhead conveyor which transfers some or all of the packs onto one or more additional belts. The pneumatic conveyor has an apertured disk which is driven at a constant speed and rotates at a level above the first belt so that a portion of the disk overlaps the path of oncoming packs. The disk rotates below one or more suction chambers at least one of which is normally disconnected from and can be connected to a suction generat-

ing device when a selected pack reaches the disk whereby the disk cooperates with the suction chamber to lift the selected pack off the first belt and to transfer it onto another belt. The selection is made by a circuit employing a detector which is adjacent to the first belt and serves to produce signals in



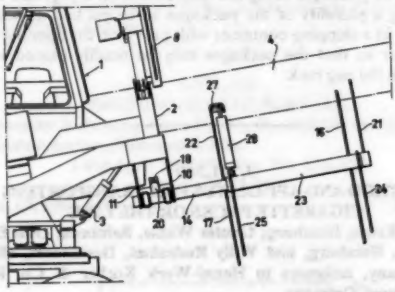
response to detection of defective packs or in response to detection of each pack whereby a timer circuit energizes the solenoid of a valve which controls the evacuation of air from a suction chamber above the revolving disk to effect the transfer of each second or third, etc. pack onto a second belt and the transfer of all other packs onto a third belt.

3,721,341

SORTING ARRANGEMENT

Karl Thore Lindblom, Alfta, Sweden, assignor to Ostbergs Fabrik AB, Alfta, Sweden

Filed May 28, 1971, Ser. No. 148,076
Claims priority, application Sweden, June 1, 1970, 7526/70
Int. Cl. B07c
U.S. Cl. 209—74 R **9 Claims**



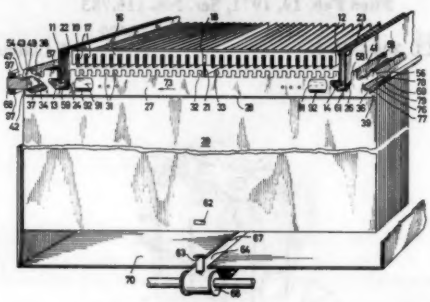
At a sorting arrangement according to the invention is provided an underlying drop shaft adapted to receive wood sections of a first dimension dropped down centrally. The shaft is defined on two opposed sides by pivotal guide means located with their horizontal bearing axle below the upper level of the shaft. Each of the guide means has such an extension in the direction perpendicular to the axle that by inclination it can be caused to project into the central area of the drop shaft to deflect centrally dropped objects of a second and, respectively, third dimension to a collecting place on one and, respectively, the other side of the shaft.

3,721,342

APPARATUS FOR SELECTING AN INDEX CARD OF SHEET-LIKE FORM

Gerhardt Sandt and Heinrich Ostermeier, Cologne, Germany, assignors to Datagraph AG, Zug, Switzerland

Filed Nov. 9, 1971, Ser. No. 196,952
Claims priority, application Germany, Dec. 23, 1970, P 20 63 414.4
Int. Cl. B67c *9/00*
U.S. Cl. 209—80.5 **17 Claims**



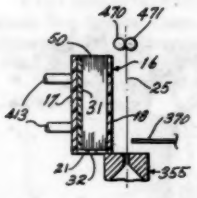
A stack of index cards are retained in hanging fashion by metal strips secured along their top edges. Coding strips along one edge of the cards allow a selected card to be withdrawn from the stack. The metal strips have jaw-like members having narrowed recesses opening in the direction of removal of the card. A rod with faces diverging in the removal direction is moved into the recess for widening the jaw-like member for removing the card, the length of the faces being greater than the path of removal of the index cards.

3,721,343

METHOD OF CHECKING CARD FILE ACTIVITY

Lewis B. Mustain, Cincinnati, Ohio, assignor to The Mosler Safe Company, Hamilton, Ohio

Filed May 21, 1971, Ser. No. 145,840
Int. Cl. B07c *3/10*
U.S. Cl. 209—110.5 **4 Claims**

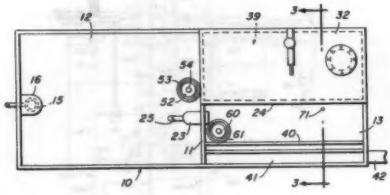


The activity of edge coded cards stored in a storage compartment of a file is checked by always returning cards to the file at the same relative position in the storage compartment. A distinctive dummy card inserted into the compartment at the infile position enables cards thereafter selected, used and returned to the file to be isolated on one side of the dummy card from the unselected cards. Therefore, any cards still on the unselected card side of the dummy card after a specified period have never been used and may, if so desired, be purged from the file as obsolete or inactive.

3,721,344
APPARATUS FOR TREATING WASTE WATER

Kai Lennart Rost, Hallowell, Maine, assignor to Pollutrol Industries Inc., Portland, Maine

Continuation of Ser. No. 57,290, July 22, 1970, abandoned, which is a continuation of Ser. No. 794,118, Jan. 22, 1969, abandoned. This application July 22, 1971, Ser. No. 164,996
Int. Cl. B01d *29/24*
U.S. Cl. 210—104 24 Claims

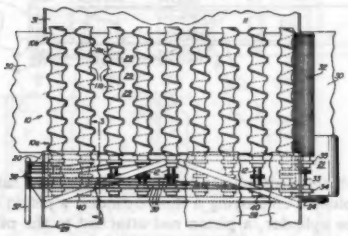


Water treating apparatus is disclosed that has a first chamber to receive the waste water, a second chamber having a discharge provided with an overflow inlet and an expansion chamber extending downwardly into it to receive within it part of the second chamber contents, and means to transfer first chamber contents into the second chamber. Aeration may be effected in both chambers and when the transfer means into the second chamber and the second chamber aerating means are not working, the second chamber functions as a settling chamber. Means are provided then to deliver air into the expansion chamber to force water out of it thus to raise the second chamber level to cause an overflow through the discharge, the overflow being relatively clear after a predetermined settling interval.

3,721,345
METHOD AND MACHINE FOR SELECTING POTATOES OF GIVEN SIZE FROM MASSED POTATOES OF RANDOM SIZE

Scott W. Brown, and Owen K. Ward, both of Pocatello, Idaho, assignors to Milestone, Inc., Pocatello, Idaho

Filed May 6, 1971, Ser. No. 140,881
Int. Cl. B07b *13/04*
U.S. Cl. 209—107 10 Claims



Potatoes or other items of random sizes are fed, en masse, onto one end of a sizing deck made up of longitudinally extending screw rolls rotatably mounted in mutually spaced, side-by-side relationship, and are conveyed toward the opposite, discharge end of the deck. Oversize items are retained by the deck and travel thereover to discharge, while others drop through the deck and are collected below. The screw threading of the rolls is of the same hand throughout and of scalloped formation, with uppermost portions of the screw thread and valley substantially aligned, respectively, diagonally across the deck, so as to define longitudinally extending, side-by-side series of sizing openings. The rolls are all rotated in the same direction for conveying the fed items toward the discharge end of the deck, and guide means, preferably a rotating roller, is provided along the side of the deck toward which the items tend to move in their travel from the feed end toward the discharge end of the deck. Provision is preferably made for adjusting the spacing of the rolls relative to each other.

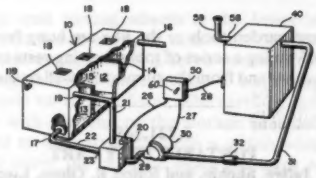
ERRATUM

For Class 210—104 see:
Patent No. 3,721,344

3,721,346
DESTRUCTIVE DISTILLATION OF DOMESTIC SEWAGE

Raymond J. Lore, 1884 N.W. North River Drive, and Carl W. Draudt, Jr., 2525 N.W. 18th Terrace, both of Miami, Fla.

Filed June 1, 1971, Ser. No. 148,641
Int. Cl. C02c *1/00*
U.S. Cl. 210—121 2 Claims



Disclosed is a system and method for the destructive distillation of domestic wastes by the flash evaporation of a liquid resulting from domestic waste materials from which sediment has been removed and biological reduction and liquefaction effected through a plurality of stages incorporated in a septic tank. When a designated quantity of effluent has been provided thereby, a level sensing device actuates the heating elements of a reactor type furnace which on reaching a certain temperature actuates a pump that directs the flow of accumulated effluent to the furnace wherein the effluent is first preheated, then discharged into a reactor to effect the flash evaporation of the effluent and its discharge as a vapor from the furnace.

3,721,347
PURIFICATION DEVICE FOR REMOVING HEAVY COMPONENTS FROM A SUSPENSION

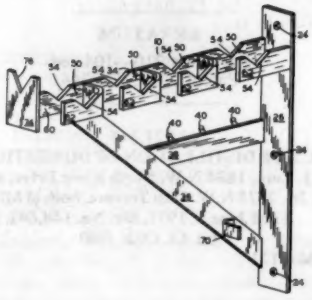
Jacob Pielkenrood; Willem L. B. Ambrosius, and Willem Kooistra, all of Krommenie, Netherlands, assignors to Pielkenrood-Vinitex N.V., Assendelft, Netherlands

Filed June 26, 1970, Ser. No. 50,283
Int. Cl. B01d *21/02*
U.S. Cl. 210—519 16 Claims

A device for purifying a liquid, comprising a separator with corrugated plates or troughs, the longitudinal axis of which includes, in the operational posision, an angle with the horizontal plane, the lower end of which separator is immersed completely but only at a small depth in the liquid in a supply basin, the upper end of the separator being closed in an airtight manner and being connected to a suction means, which may maintain a liquid flow in the separator, the liquid being taken from the surface of the liquid in the basin where the

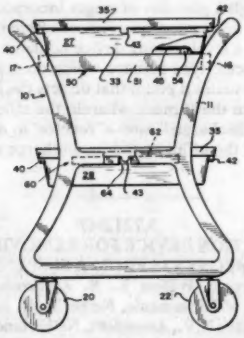
sediment concentration is low, and the sediment precipitated in the separator is turned to the basin separated from the liquid entering this separator.

3,721,348
MEANS FOR SUPPORTING TOOLS
Robert L. Cook, 2210 East Washington, Escondido, Calif.
Filed July 8, 1971, Ser. No. 160,824
Int. Cl. B25h *3/04*; A47b *81/02*; A47f *7/00*
U.S. Cl. 211—60 T **4 Claims**



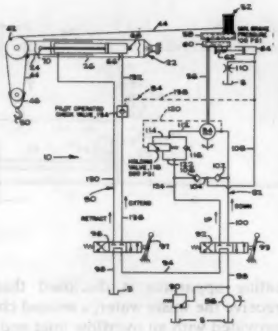
House and garden tools or the like are hung from bracket-like means forming a series of tool receiving rests spaced apart from each other and from the supporting wall or the like.

3,721,349
PORTABLE TRAY CART
Robert D. Jaffee, Skokie, and Ralph B. Olson, Lombard, both of Ill., assignors to Amco Wire Products Corp., Chicago, Ill.
Filed June 18, 1971, Ser. No. 154,405
Int. Cl. A47f *3/14*
U.S. Cl. 211—126 **9 Claims**



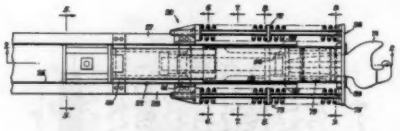
A portable tray cart has a first set of rails for supporting a first tray and a second set of rails positioned in a spaced relation below the first set of rails for supporting a second tray. The first set of tray support rails has upwardly extending supports which fit into a recessed bottom in the tray to hold the same in a fixed position on the cart. A flange portion about the top of the tray has projections which fit into apertures in the second set of rails for supporting the second tray in a fixed position below the first tray. Each of the trays has the projections and recessed bottoms so they can be used interchangeably with the first and second set of rails.

3,721,350
BOOM EXTENSION CONTROL SYSTEM
Oliver T. Nephew, Cedar Rapids, Iowa, assignor to FMC Corporation, San Jose, Calif.
Filed Feb. 12, 1970, Ser. No. 10,961
Int. Cl. B66c *23/06*
U.S. Cl. 212—55 **5 Claims**



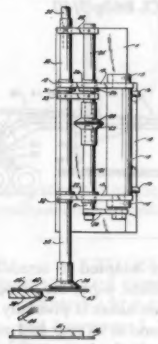
A boom extension control system for employment with hydraulically extensible booms having hydraulic load lifting cable winches effective to provide an interlock between the boom and winch controls whereby extension of the boom is prevented until the winch is operated.

3,721,351
HYDRAULIC AND RESILIENT CUSHIONED RAILWAY CAR DRAFT APPLIANCE
Osvaldo Frank Chierici, Elmhurst, and James Thomas Smith, Wilmette, both of Ill., assignors to Holland Company, Lombard, Ill.
Filed Sept. 14, 1970, Ser. No. 71,858
Int. Cl. B61g *9/12*
U.S. Cl. 213—8 **1 Claim**



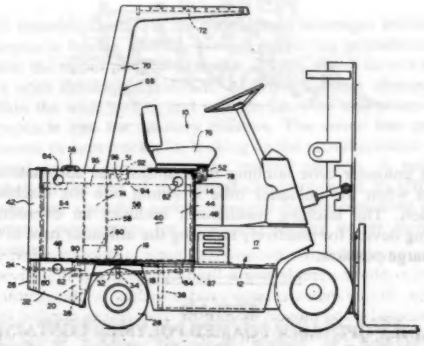
A combined hydraulic and resiliently cushioned railway car draft appliance employing a fluid cylinder, a piston disposed within the cylinder, a piston rod attached to the piston and connected to be moved by buff or draft forces applied to the draft appliance, and having a urethane collar disposed within the cylinder surrounding the piston rod. The urethane collar is effective to improve train action by providing a variable cushioned resistance in draft and does not bottom out as a spring might to allow metal to metal contact. The hydraulic section and coupling yoke section are separably connected thereby facilitating installation and removal. No flow control, or pressure relief valves or bellows are employed to accomplish the fluid cushioning thereby eliminating many potential repair problems.

3,721,352
DRIVE MECHANISM EMPLOYING SUCTION CUP COUPLING
Edwin E. Messmer, 203 Leonard Young Street, Oradell, N.J.
Filed Aug. 6, 1971, Ser. No. 169,666
Int. Cl. B66c *1/02*
U.S. Cl. 214—1 BT **11 Claims**



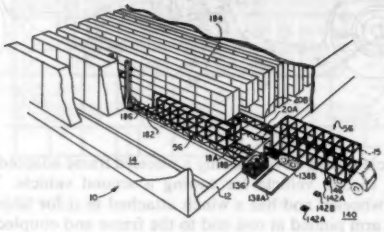
A drive mechanism including a drive member, such as a piston movable within a pneumatic cylinder, a working member, such as a label applicator for transferring labels from a supply strip to merchandise packages, and a coupling for transmitting motion from the drive member to the working member. The coupling includes at least one, and preferably a pair of opposed suction cups which adhere to each other, but which separate to break the driving connection when the working member meets more than a predetermined resistance. When one suction cup is employed, it cooperates with a member having a flat surface.

3,721,353
COMBINED BATTERY CASE, COUNTERWEIGHT AND OVERHEAD GUARD
Dennis E. Erickson, Battle Creek, Mich., assignor to Clark Equipment Company
Filed Dec. 14, 1970, Ser. No. 97,830
Int. Cl. B26d *25/00*
U.S. Cl. 214—38 CA **11 Claims**



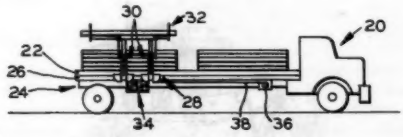
A battery case, counterweight and overhead guard assembly for battery driven lift trucks in which the truck chassis provides a main central upward projection registrable with an opening in a fork receiving member which depends from the bottom of the assembly and which is in turn registrable with an opening in the chassis. Vertical open pockets are provided at opposite sides of the assembly for receiving the vertical legs of an overhead guard which is otherwise unsecured to the assembly. The assembly, plus a battery receivable in the battery case, is removable from the truck, as by a second lift truck or an overhead crane, either in parts or as a complete assembly.

3,721,354
MATERIALS HANDLING SYSTEM
Burt F. Raynes, Chula Vista, Necati Kanatsiz, Spring Valley, and Robert E. Ottle, San Diego, Calif., assignors to Rohr Industries Inc.
Filed July 27, 1970, Ser. No. 58,345
Int. Cl. B65g *67/24*
U.S. Cl. 214—38 D **7 Claims**



A storage unit having wheels at the lower side edges thereof is transferred between rails on a carrier and rails on a platform by means of a drive mechanism comprising a carriage slidably mounted on a track disposed between the rails on the platform. The carriage is releasably engageable with one end of the storage unit, and a cable is connected to the carriage and to a winch which can be operated to move the carriage along the track to thereby transfer the storage unit from the carrier to the platform and vice versa.

3,721,355
VEHICLE MOUNTED LOADER AND UNLOADER
Joseph F. Irving, 316 Fulton St., Swanton, Ohio 43558
Filed Sept. 27, 1971, Ser. No. 183,870
Int. Cl. B60p *1/48*
U.S. Cl. 214—80 **19 Claims**



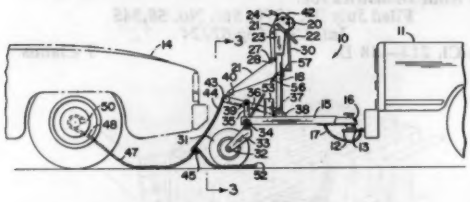
A vehicle mounted mechanism for manipulating long load units such as pipe lengths which extend over a substantial portion of the load carrying lengths of the vehicle. The mechanism includes an articulate linkage attached to move along the side of the vehicle bed. The linkage is operable between the ground and an elevation substantially above the bed and over a substantial range transverse of the bed to engage elongate objects for transfer between ground elevation and the bed. The linkage includes an inner and outer boom together with a cradle, all of which are automatically collapsible and retractable, stored beneath and within the width limits of the bed of the vehicle to provide adequate road clearance and form a compactly stored unit when the vehicle is in transit. In one embodiment the linkage is capable of operating in a position adjacent the wheels of a semi-trailer and of being stored between the wheels on the trailer and the wheels on the truck.

3,721,356

VEHICLE TOWING DEVICE

John M. McNeill, 609 Lavon Court, P.O. Box 636, Kissimmee, Fla.

Filed April 28, 1971, Ser. No. 138,097
Int. Cl. B60p 3/12
U.S. Cl. 214—86 A 9 Claims



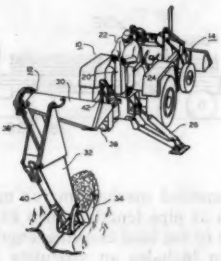
A vehicle towing device having a wheeled frame adapted for coupling to one vehicle for towing a second vehicle. The frame is wheeled and has a winch attached to it for lifting a swinging arm pinned at one end to the frame and coupled by means of a cable from the winch to the other end of a swinging arm which also is attached to one or more flexible belts which are adapted to swing under the bumper of a disabled vehicle, with the other end of the belt adapted for connection to the axle in a manner that can be adjusted to place a belt directly under the bumper so that when the winch reels in the cable, it lifts the swing arm to lift the belt on the bumper for lifting one end of the disabled vehicle for towing.

3,721,357

MULTIFUNCTION INTEGRATED CONTROL MECHANISM

William A. Williamson, Niles, Mich., assignor to Clark Equipment Company

Filed July 15, 1970, Ser. No. 54,890
Int. Cl. E02f 3/00
U.S. Cl. 214—138 R 18 Claims



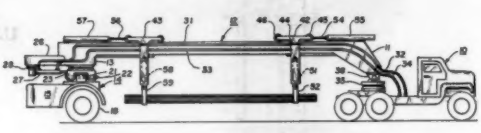
A control mechanism designed principally for use with a backhoe having a boom, a dipstick connected to the boom, a bucket pivotally mounted on the outer end of the dipstick and an actuating means for raising and lowering and slewing the boom, moving the dipstick forwardly and rearwardly, and curling the bucket, in which a single handle is used to control the multifunctions for simultaneously moving any one or more of the elements in varying degrees. A differential transformer is preferably used as a control producing signal for each of the elements, the transformers having a probe connected to and operated by the single handle or two handles in unison. The control mechanism may be used for other types of equipment and a different combination of functions.

3,721,358

SELF-LOADING CARRIER

Gibson E. Brock, R.D. No. 5, Persimmon Road, Sewickley, Pa.

Filed Nov. 12, 1970, Ser. No. 88,530
Int. Cl. B60p 3/40
U.S. Cl. 214—394 1 Claim



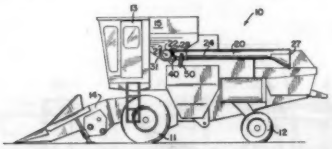
An over-the-road carrier adapted to straddle and pick up elongated loads such as billets, pipe, etc., stocked in parallel piles on the ground between aisles is pivotally mounted at its front end on a tractor unit and at its rear end on a remote control powered trailing end unit. the latter unit is rotatable from a position in which its wheels travel in the direction of the long axis of the carrier to a position at right angles thereto. The carrier is maneuverable from its traveling position to its loading position by steering its tractor unit into one aisle, rotating its trailing end unit 90° and then driving the trailing end unit into the other aisle so that the carrier pivots about its tractor unit into a position parallel to the long axis of the load. Both tractor and trailing end units are then driven along their respective aisles to position the carrier over the desired load.

3,721,359

UNLOADER TUBE LATCHING MECHANISM

Elvin L. Howell, and James Corwith, both of Bettendorf, Iowa, assignor to International Harvester Company, Chicago, Ill.

Filed June 18, 1971, Ser. No. 154,541
Int. Cl. B60p 1/40
U.S. Cl. 214—522 9 Claims



An unloader tube latching mechanism that automatically hooks when the unloader tube is swung into the discharge position. The latching mechanism includes an overcenter locking device for positively securing the unloader tube in the discharge position.

3,721,360

READILY OPENABLE FOAMED POLYMER CONTAINER

Stafford D. Collie, Kansas City, Mo., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed March 2, 1970, Ser. No. 15,346
Int. Cl. B65d 17/24, 1/00
U.S. Cl. 215—32 3 Claims

A container is constructed from a foamed polymer and closed by heat sealing. It is provided with a score line, cut, or notch, as by the sealing apparatus at the plate at which it is to be rendered openable by tearing, cutting, etc. In one embodi-

ment a high density polyolefin, e.g., polyethylene, is foamed and formed into a container or bottle and, when filled, is heat

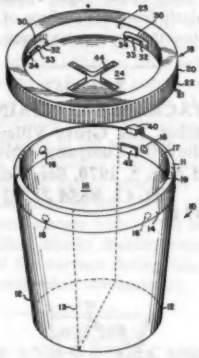
sealed as by bringing together in a sealing head the walls of the container and simultaneously providing the score or tear line.

3,721,361

PRESSURIZED BEVERAGE CONTAINER WITH TWIST REMOVABLE COVER

Arthur J. Barry, and Lawrence J. Barry, both of 176 Cross Street, Lowell, Mass.

Filed Nov. 29, 1971, Ser. No. 202,945
Int. Cl. B65d *39/08*
U.S. Cl. 215—50 **11 Claims**



A reusable container for pressurized beverages includes a receptacle having spaced, inward projecting protuberances, inside the upper portion of a wide mouth, which do not interfere with drinking therefrom. A twist-off cover closure fits within the wide mouth and extends up, over and around the receptacle rim for sanitary reasons. The cover has spaced grooves, or cam tracks, for locking on the protuberances when turned and a concave-convex central portion. A resilient gasket on the rim of the receptacle compresses to affix the cover, and a similar gasket, engaged by the concaved cover portion, compresses for increased sealing under beverage pressure.

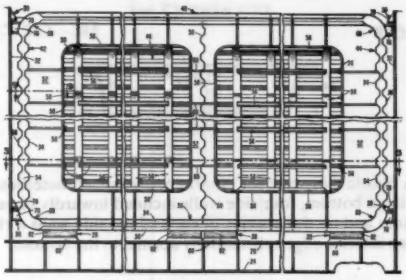
3,721,362

DOUBLE WALL CORRUGATED LNG TANK

Thomas F. Bridges; George R. Knight, Jr., both of Port Washington, N.Y., and Ivan Mertl, Greenwich, Conn., assignors to John J. McMullen Associates, Inc., New York, N.Y.

Filed Sept. 9, 1970, Ser. No. 70,869
Int. Cl. B65d *25/18*
U.S. Cl. 220—9 LG **23 Claims**

A double wall tank for the marine transportation of liquefied natural gases at atmospheric pressure and cryogenic temperature, the tank having its primary and secondary barriers supported in such a way that the respective barrier supports are in alignment. The walls of the inventive tank, in its preferred embodiment, are corrugated in a horizontal direction. All liquid-tight welds are either butt or seam welds, and all transitions between the walls of the tank are smooth, without intermediate box girders. A plurality of vertical webs support the primary barrier of the tank; and a plurality of



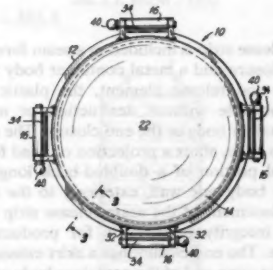
diaphragms, intermediate the primary and secondary barriers, are positioned in alignment with the vertical webs and support the secondary barrier. The vertical webs are stabilized by lightweight channel-shaped struts; corner plates support the corners of the tank and serve as base members for the struts. The tank is supported and keyed at the bottom only, thereby reducing the load transmitted to the structure of the ship near the top of the tank.

3,721,363

QUICK-OPENING MANWAY CLOSURE

Marcus N. Bressler, Wilmington, Del., and Norman C. Sebelish, Boothwyn, Pa., assignors to Gulf & Western Industries, Inc., New York, N.Y.

Filed Sept. 16, 1970, Ser. No. 72,683
Int. Cl. B65d *43/16*
U.S. Cl. 220—32 **15 Claims**



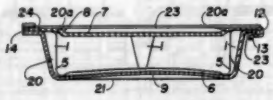
A manway closure which provides a quick-opening entrance to a pressure vessel. The closure includes a domed cover which swings between open and closed positions with respect to a ring fixed to the vessel. The cover at its rim seats against an interior face of the ring and a sealing gasket is located between the cover rim and the interior face of the ring. The cover is constructed with respect to the ring so that when fluid pressure is applied internally of the assembly, the cover rim expands against the ring, compressing the gasket and thus forming a rupture-resistant seal.

3,721,364

PLASTIC MAGAZINE FOR PHOTOSENSITIVE SHEET MATERIALS

Heinz Kurt Lukaschewitz, Wolfen; Johannes Walter Buchmann, Bobbau, and Bernard Lpu Walther, Dessau, all of Germany, assignors to Veb Filmfabrik Wolfen Fotochemisches Kombind, Wolfen, Germany

Filed Nov. 17, 1970, Ser. No. 90,236
Int. Cl. B65d *43/12*
U.S. Cl. 220—41 **7 Claims**



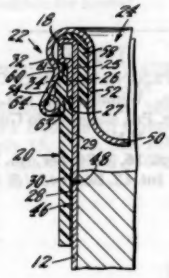
A plastic magazine for photosensitive sheet materials, comprising a bottom, four side walls inclined inwardly toward the bottom and on the interior of each of the side walls a rib having an interior edge substantially normal to the bottom.

3,721,365

FULL EASY OPEN AND RECLOSABLE METAL CONTAINER

William Thomas Saunders, Weirton, W. Va., assignor to American Can Company, Greenwich, Conn.

Filed June 30, 1971, Ser. No. 158,402
Int. Cl. B65d *43/04, 17/16*
U.S. Cl. 220—47 **7 Claims**



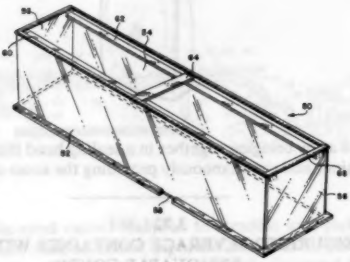
A plastic release strip is included in a seam formed between a metal end closure and a metal container body to serve as a seam holding and release element, the plastic strip being manually removable without destruction or mutilation of either the container body or the end closure. The seam release strip, at its top edge, abuts a projection or bead formed by an inner marginal portion of a doubled-back longitudinal end section of the body side wall, exteriorly to the side wall, to preclude displacement of the seam release strip and thereby ensure seam integrity particularly for products contained under pressure. The end closure has a skirt extending longitudinally from the open end of the container body and having an inwardly indented annular portion which compresses the portion of the strip that abuts the bead to thereby facilitate sealing of the open end of the container body by the end closure and further enhance the integrity of the seam. The skirt of the end closure also has a peripheral, annular, inwardly-directed curled hem which compresses the portion of the strip that engages an exterior annular surface of the body side to thereby cause that portion to further frictionally engage the sharp raw metal edge on an outer marginal portion of the double-back end section of the container side wall which further facilitates sealing of the open end of the container body by the end closure and still further enhance the integrity of the seam.

3,721,366

GLASS TANK CONSTRUCTION

Barry W. Battershall, 2626 Natalie Drive, and William F. Hoffman, 2904 Natalie Drive, both of Plano, Tex.

Filed Dec. 21, 1970, Ser. No. 99,779
Int. Cl. B65d *25/54*
U.S. Cl. 220—82 R **10 Claims**



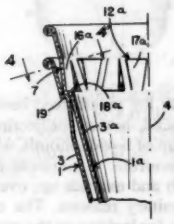
A frameless aquarium assembled from non-corrosive material by utilizing an adhesive to attach and seal between the adjacent parts. The longer sides having brace members attached adjacent their upper edge. These brace members extend perpendicularly from the surface of the longer sides and can be attached together by a cross brace.

3,721,367

STACKABLE CONTAINERS

Robert W. Fletcher, Elk Grove Village, Ill., assignor to Standard Oil Company, Chicago, Ill.

Filed Aug. 3, 1970, Ser. No. 60,689
Int. Cl. B65d *21/02*
U.S. Cl. 220—97 C **11 Claims**



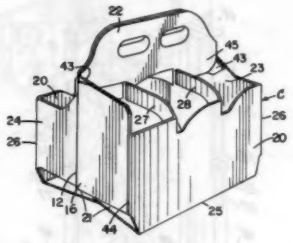
A stackable container comprising a bottom; a sidewall integral with said bottom tapering upwardly and outwardly from said bottom and terminating in an open upper end; a first circumferential intermittent shoulder in the container sidewall; and a second circumferential intermittent shoulder in the container sidewall, at least one of said shoulders being formed by spaced projections no part of which slope inwardly toward the central axis of the container, the other shoulder may be comprised of spaced portions no part of which slope inwardly toward the central axis of the container, the effective width of each projection forming one shoulder being greater than the spacing between the spaced projections or portions of the other shoulder, thereby positively limiting the nesting of like telescopically associated containers.

3,721,368

BOTTLE CARRIERS AND METHOD OF FABRICATING SAME

Edwin L. Arneson, Hillsdale, N.J., assignor to Federal Paper Board Company, Inc., Montvale, N.J.

Filed Aug. 10, 1970, Ser. No. 62,360
Int. Cl. B65d 75/00
U.S. Cl. 220—115 2 Claims



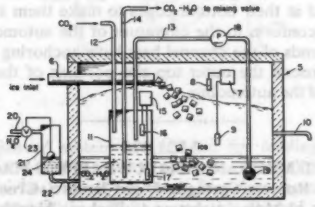
A strap style cellular carrier for bottled beverages, or like articles, which is formed from an elongate paperboard blank and a method of fabricating the same in collapsed condition which is characterized by cutting the blanks from a continuous web of stock material, which may be printed on the outside face, with the blanks extending lengthwise in the long direction of the web and nested laterally so that continuous lines of heat activatable adhesive may be applied to the inside faces of the blanks which adhesive lines will traverse nested handle and center partition forming panels extending from the top forming side wall margin at one side of adjoining blanks and nested bottom forming panels extending from the bottom forming side wall margins at the opposite sides of the blanks, thereafter activating the adhesive only on the areas of the handle and partition forming panels which are to be adhered to each other and finally folding the blanks while they are advanced in a continuous stream without the need for timing or indexing the individual blanks thereby enabling continuous high speed travel of the carriers during fabrication and high volume production with minimum material.

3,721,369

ICE STORAGE AND WATER CARBONATING SYSTEM

Robert F. Conti and Don S. Follett, Easton, Pa., assignors to Follett Corporation

Filed Dec. 28, 1970, Ser. No. 101,553
Int. Cl. B67d 5/08
U.S. Cl. 222—67 6 Claims



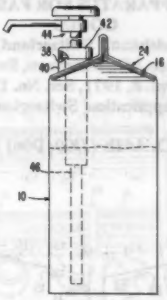
This invention is directed to an ice storage and water carbonating system that includes a water carbonating vessel located within an ice storage chest. Carbon dioxide under pressure and make-up water are supplied to the carbonating vessel. The make-up water is drawn from the bottom of the storage chest and includes melt water from the ice therein plus any amount of externally supplied water that may be required beyond that solely available from the melt water. Suitable controls are provided to maintain the ice, water and carbonated water levels within predetermined ranges.

3,721,370

DISPENSER APPARATUS FOR DISPOSABLE CARTON

Marshall R. Blum, 1224 Maripasa, San Francisco, Calif.

Filed May 15, 1970, Ser. No. 37,606
Int. Cl. B65d 5/72
U.S. Cl. 222—385 8 Claims



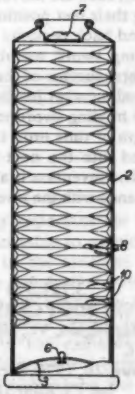
Apparatus for dispensing materials from disposable cartons of the type having a sloping top provided with a central upstanding seal closing the top. The apparatus includes a pair of sloping sides which conform to the top of the carton and means interconnecting the sides for attaching the same to the seal. One of the sides has a hole therethrough for receiving a pump which is adapted to extend into the carton and operable to remove the contents thereof. The other side of the device can be provided with a second hole defining a template for use in cutting a hole in the carton.

3,721,371

DISPENSING CONTAINER

Gilbert Dolveck, Barthelemy de Beaurepaire, France, assignor to Aluminium Suisse S.A., Chippis, Switzerland

Filed Oct. 27, 1970, Ser. No. 84,445
Claims priority, application Switzerland, Oct. 29, 1969, 16082/69
Int. Cl. B65d 23/00
U.S. Cl. 222—386.5 5 Claims



A dispensing container includes a cylindrical hollow body containing therein a deformable member separating a product

to be dispensed from a propellant gas. When an outlet in the hollow body is opened, the deformable member is deformed by the gas and forces the product to be discharged through the outlet. A tubular side wall of the deformable member has a plurality of fold lines forming an array of alternately disposed trapeziums which define cavities in staggered formation whereby deformable member is expansible or contractable in a concertina fashion.

3,721,372

METHOD AND APPARATUS FOR FABRICATING PILE GOODS

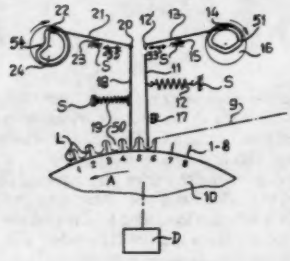
Paul Reinhard, Meichnau, Switzerland, assignor to Teppichfabrik Meichnau AG., Meichnau, Switzerland

Filed Sept. 8, 1971, Ser. No. 178,751

Claims priority, application Switzerland, Sept. 17, 1970, 13777/70

Int. Cl. A41h *43/00*; D06j *1/00*

U.S. Cl. 223—30 **21 Claims**



A method of, and apparatus for, the fabrication of pile goods in which the pile material is introduced through the intermediary of an infeed sword member into the spaces formed between radially extending lamellae located about the periphery of a revolving drum. During introduction of the pile material into these spaces, this material is fixedly retained relative to the drum by holding means in the form of a holding sword member. The infeed sword member and the holding sword member are moved towards and away from the drum and during their work position at the drum while in the neighborhood thereof such are moved in the direction of drum rotation and during their rest position when remote from the drum they are moved back opposite to the direction of drum rotation. The holding sword member is introduced into a space at the peripheral surface of the drum before or directly after the infeed sword member has been withdrawn from such space, and then the holding sword member is retained in this space for such length of time until the infeed sword member has been introduced into the next space, whereupon these operations repeat. The invention is also directed to pile goods produced in accordance with the inventive method.

3,721,373

SKI BOOT CARRIER

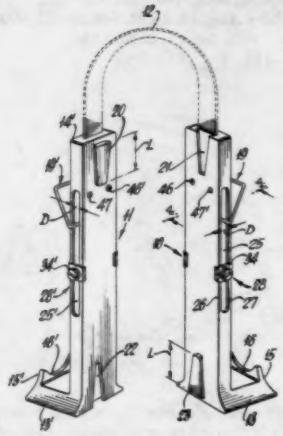
Robert Penniman, Burlington, Vt., assignor to Barrec Products Co., Shelburne, Vt.

Filed Nov. 20, 1970, Ser. No. 91,350

Int. Cl. A45f *5/00*

U.S. Cl. 224—5 Z **16 Claims**

The invention contemplates a boot carrier suitable for ski boots, wherein each boot has its own separate bracket to which it is mounted and adjustably clamped. The brackets are interconnected by a flexible strap to permit the option of shoulder-slung portage. The brackets are also separately inter-



connectable to provide the further option of mutually braced standing support, for neat storage off the floor.

3,721,374

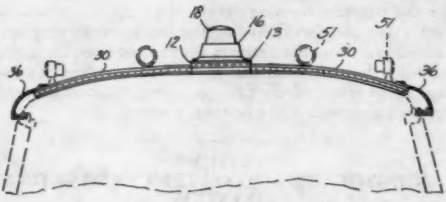
LAMP MOUNT FOR AUTOMOTIVE VEHICLES

George W. Eby, 1015 Molalla Avenue, Oregon City, Oreg.

Filed Aug. 10, 1971, Ser. No. 170,471

Int. Cl. B60r *11/00*

U.S. Cl. 224—42.1 B **7 Claims**



A mounting bracket assembly for supporting an emergency light on the roof of an automobile. The bracket assembly is composed of a pair of aligned downwardly facing channel bars to the inner ends of which is adjustably connected an emergency lamp mounting plate. The flanges of the channel bars are notched at their bottom edges to make them sufficiently flexible to conform to the curvature of the automobile roof. The outer ends of the channel bars have anchoring hooks engageable around the outer top rim portions of the opposite doorways of the automobile.

3,721,375

WEB FEED MECHANISM FOR WRAPPING MACHINES

Franklin B. Roberts, Springfield, and James S. Groom, Hampden, both of Mass., assignors to Package Machinery Company, East Longmeadow, Mass.

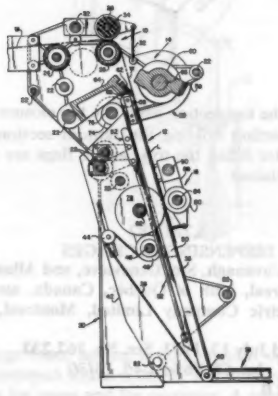
Filed Feb. 1, 1971, Ser. No. 111,281

Int. Cl. B26f *3/02*

U.S. Cl. 225—96 **4 Claims**

An apparatus for feeding a web of material, such as a plastic film or paper, from a supply roll and for cutting it into sheets of desired length to be used in a package wrapping machine or the like. The apparatus utilizes driven opposed rolls to

withdraw the web from the supply roll and to advance the leading section of the web onto the end of a driven conveyor which retains the section by vacuum. A cutter mechanism is driven in timed relationship to the web movement to slash the web transversely as it passes from the rolls onto the conveyor.



The transverse slashing provides a serrated cut, leaving tabs which connect the leading section on the conveyor with the remainder of the web. Then, in further travel, opposed high speed rollers engage the leading section on the conveyor to tear the tabs and thus separate the leading section as a wrapper sheet of required length.

3,721,376

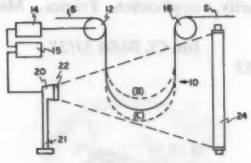
TENSIONLESS VARIABLE FEED SYSTEM FOR A TRAVELING STRIP

Donald K. Christian, Spartanburg, and Jerry M. Minchey, Mauldin, both of S.C., assignors to Piedmont Engineering and Machine Company, Inc., Spartanburg, S.C.

Filed May 3, 1971, Ser. No. 139,695

Int. Cl. B65h *25/10*

U.S. Cl. 226—42 **9 Claims**



An improved system is disclosed for feeding a strip of material at variable speeds under substantially tensionless conditions. The strip is fed into a loop forming area where a light source is disposed along one side thereof and extends therealong. A single photosensitive device is disposed along an opposite side of the loop forming area and is provided with a lens system, such as a wide angle lens, to enable the photosensitive device to receive light from substantially the entire length of the light source. The photosensitive device is operatively associated with a control circuit which generates an electrical signal proportional to the size of the input to the circuit from the photosensitive device. The proportional electrical signal is then used to regulate the speed of the traveling strip so as to maintain the substantially tensionless conditions.

3,721,377

WEB FEEDING APPARATUS

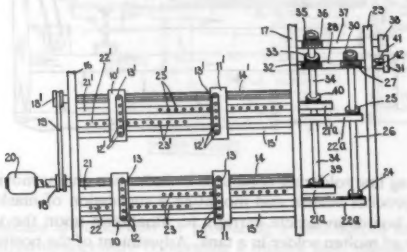
Cyril John Atkinson, Royston, England, assignor to International Computers Limited, London, England

Filed Nov. 23, 1971, Ser. No. 201,304

Claims priority, application Great Britain, March 26, 1971, 08,235/71

Int. Cl. B65h *17/38*

U.S. Cl. 226—74 **5 Claims**



For variation of the lateral positions of pairs of paper tractors, each tractor is slidable on a separate rack which is itself axially slidable. Coarse adjustment is according to preset positions of the tractors on the racks. Fine adjustment is by driving both racks of a pair of tractors together or driving only one of those racks.

3,721,378

APPARATUS FOR HANDLING FLEXIBLE SUPPLY LINES

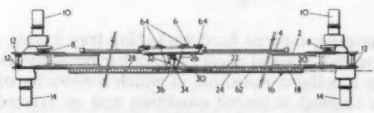
David Emrys Hughes, Bridgend, and Donald Davies, Maesteg, Wales, assignors to Coal Industry (Patents) Limited, London, England

Filed Jan. 31, 1972, Ser. No. 222,052

Claims priority, application Great Britain, Feb. 23, 1971, 5,226/71

Int. Cl. B65h *23/00*

U.S. Cl. 226—119 **11 Claims**



Supply line handling apparatus for a mining machine consists of a trough securable to a guide for the machine. A bracket is attached to the machine and carries a feed arm through which the supply line passes to the machine, the arm extending into the trough to feed the line thereinto. The trough is provided with a number of displaceable resilient members, for example loops of resilient flexible material, which provide a gate across the trough. Upon movement of the machine the members are displaced by the arm which feeds the line into the trough below the members which, after the machine has passed, return to their entrapping position and retain the line within the trough.

3,721,379

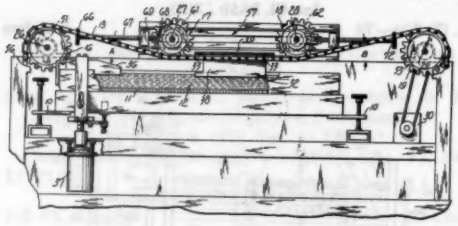
APPARATUS FOR TREATING ARTICLES WITH A LIQUID

Vincent A. Corsaro, Haverhill, Mass., assignor to Western Electric Company, Incorporated, New York, N.Y.

Division of Ser. No. 745,253, July 16, 1968, abandoned. This application Aug. 21, 1970, Ser. No. 66,049

Int. Cl. B23k *1/08*

U.S. Cl. 228—39 **10 Claims**



A drag line soldering apparatus includes two chains moving over sprocket wheels and mounting a succession of masked circuit boards in article carriers for floatation upon the top surface of molten solder in a tank. Adjustment of the position of certain of the sprocket wheels selects a critical angle of withdrawal of the boards from contact with the molten solder, eliminating substantially all formation of "icicles" of solidified solder. Adjustment of the position of others of the sprocket wheels selects a desired angle of contact and a desired length of contact path between the boards and the top surface of the molten solder.

3,721,380

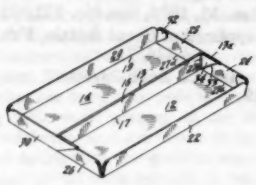
PARTITIONED TRAY

George Leroy Meyers, Menasha, Wis., assignor to American Can Company, Greenwich, Conn.

Filed Aug. 9, 1971, Ser. No. 170,040

Int. Cl. B65d *85/36*

U.S. Cl. 229—15 **8 Claims**



A one-piece tapered food packaging tray having a centrally located, integral partition member hingedly movable between a collapsed position in which a plurality of trays may be shipped in nested condition and an erected position in which the partition positively divides the tray into two separate compartments. The tray has double thickness side walls and, in the preferred embodiment, is foil coated on all inner surfaces and on the outer side wall surfaces.

3,721,381

TWO PART CONTAINER

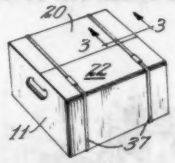
Frank W. Locke, Minneapolis, Minn., assignor to Hoerner Waldorf Corporation, Ramsey County, Minn.

Filed Sept. 8, 1970, Ser. No. 70,386

Int. Cl. B65d *5/32*

U.S. Cl. 229—23 R **2 Claims**

The container includes a top section including rectangularly arranged side and end walls, and top closure flaps hingedly connected thereto. A bottom section includes a bottom panel, and side and end walls hingedly connected to the edges thereof. Corner flaps are hinged to one pair of opposed walls to overlap the other opposed walls. The bottom section is



telescoped into the top section while the top closure flaps are open, the top section holding the bottom section in tray-shaped form. After filling the top closure flaps are closed to complete the container.

3,721,382

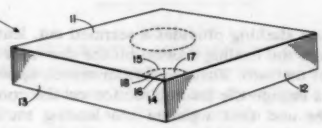
DISPENSING PACKAGES

Ronald Patrick Cavanagh, Ste. Genevieve, and Allan Richard Wright, Montreal, both of Quebec, Canada, assignors to Northern Electric Company Limited, Montreal, Quebec, Canada

Filed July 13, 1971, Ser. No. 162,232

Int. Cl. B65d *5/46, 25/30*

U.S. Cl. 229—52 B **2 Claims**



In a carton for dispensing strand material of substantial weight, inexpensive and relatively durable means for supporting the carton in the form of a corner knock-out is provided, whereby the weight is exerted on the two-sides of the carton, although supported by one hand.

3,721,383

PACKAGING ASSEMBLY OF HEAT-SEALABLE FILM MATERIAL

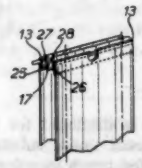
Bernard Dufes, Chilly-Mazarin, France, assignor to Altec-Soplec S.A., Ivry Sur Seine (Val de Marne), France

Filed Feb. 18, 1971, Ser. No. 116,341

Claims priority, application France, March 3, 1970, 7007489

Int. Cl. B65d *33/28*

U.S. Cl. 229—63 **8 Claims**

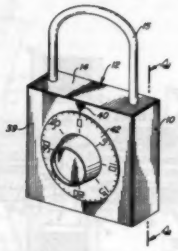


A packaging assembly of heat sealable plastics film material comprises an envelope with a closed end and an open end. The closed end is encircled by two lengths of ribbon formed from a film of similar heat sealable material. The two ribbons are contained in a guiding passage around the packaging assembly and are accessible through openings formed in the guiding passage.

3,721,384
COMBINATION LOCK BANK

Don C. Pierce, Jr., Bellevue, Ohio, assignor to Huron Products Company, Bellevue, Ohio

Filed July 14, 1971, Ser. No. 162,483
Int. Cl. A47g *29/00*
U.S. Cl. 232—4 R 1 Claim

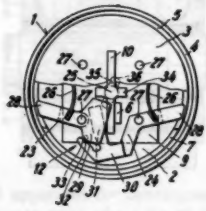


A savings bank having a combination operated lock. A frame is received within a casing and defines therewith compartments for coins and for currency. A combination dial on the casing rotates one or both of a pair of spaced, parallel discs in the casing, each disc having a peripheral notch therein. In the locked condition of the combination lock mechanism a leaf spring is biased by one or both of the discs into the path of a peg on the frame and prevents withdrawal of the frame from the casing. In the unlocked condition the notches in the discs are aligned with each other and with the head of the spring to permit the spring to retract out of the path of the peg on the frame.

3,721,385
SAVINGS BANK WITH AN INSERTION SLOT SAFETY MECHANISM AND A KEY OPERATED LOCK

Heinz Krone, Asperg, and Wilhelm Hoffmann, Ludwigsburg, Germany, assignors to Krone G.m.b.H., Ludwigsburg, Wurttemberg, Germany

Filed Dec. 4, 1970, Ser. No. 95,071
Claims priority, application Germany, Dec. 4, 1969, P 19 60 989.3
Int. Cl. A47g *29/00*
U.S. Cl. 232—4 R 4 Claims

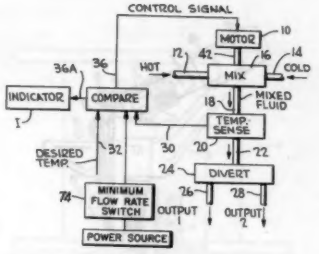


A savings bank with an insertion slot safety mechanism and a bolt lock operated by a key, in which the bolt lock is situated below the insertion slot safety mechanism and can be operated by means of a key which can be introduced into the insertion slot.

3,721,386
TEMPERATURE-VOLUME CONTROLLED MIXING VALVE

Julius H. Brick, 3 Bucknell Lane, Stony Brook, N.Y., and Wilfred Olschewski, 470 American Blvd., Brentwood, N.Y.

Filed Oct. 23, 1970, Ser. No. 83,289
Int. Cl. G05d *23/13*
U.S. Cl. 236—12 A 14 Claims

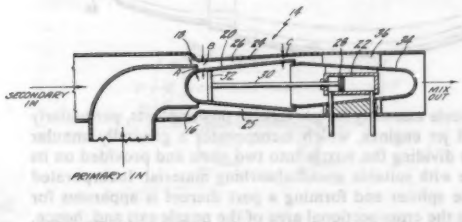


Means are disclosed for producing a fluid output having a desired temperature comprising a mixing unit, means for introducing a first fluid having a first temperature into said mixing unit, means for introducing a second fluid having a second temperature into said mixing unit, said mixing unit including means to mix said first and second fluids to yield a third fluid having a third temperature, means to sense said third temperature, means to generate a signal representative of said desired temperature, means to generate a signal representative of said third temperature, means to compare said desired temperature signal and said third temperature signal, said comparing means including means to generate a control signal representative of said comparison, and means to couple said control signal to said mixing unit to control the operation of said mixing unit to bring the temperature of said third fluid to said desired temperature.

3,721,387
EJECTOR WITH VARIABLE MIXING SECTION AND PRIMARY NOZZLE AREAS

George E. Wilmot, Jr., Warehouse Point, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed June 2, 1971, Ser. No. 149,134
Int. Cl. B05b *7/12*
U.S. Cl. 239—416.4 4 Claims

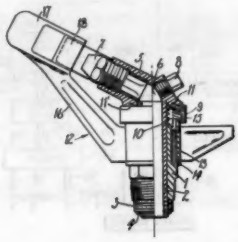


The effectiveness of a jet pump is increased over a wide range of operating pressures by varying the areas of the primary nozzle and mixing chamber so that the ratio of the two is held at a substantially constant value by a plug designed such that the ratio of any cross-sectional areas of two spaced stations of the mixing chamber along the longitudinal axis of the plug is also substantially constant for each position of the primary nozzle.

3,721,388
ROTARY WATER SPRINKLER

Alfred James Green, Poole, England, assignor to Westbourne Engineering (Bournemouth) Limited, Bournemouth, Hampshire, England

Filed May 7, 1971, Ser. No. 141,250
Claims priority, application Great Britain, May 7, 1970, 22,106/70
Int. Cl. B05b 3/02
U.S. Cl. 239—230 9 Claims

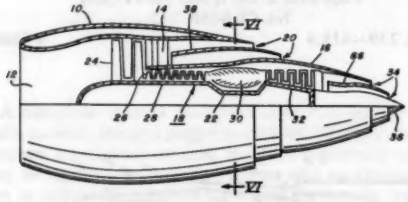


A rotary water sprinkler has a tubular body adapted to be connected to a supply of water under pressure, a nozzle assembly supported by and rotatable about the tubular body, the assembly including an upwardly directed nozzle, a swing arm having a hub portion surrounding and mounted for rotation on the tubular body, an arm extending outwardly from the hub-portion and a spoon-like portion on the arm which is impinged by a jet issuing from the nozzle to rotate the arm and biassing means which rotates the arm in the opposite direction to engage the nozzle assembly and to rotate the assembly through a small angle.

3,721,389
EXIT NOZZLE ASSEMBLIES FOR GAS TURBINE POWER PLANTS

Malcolm Iain K. MacKinnon, Seattle, and Bjarne E. Syltebo, Bellevue, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed June 10, 1971, Ser. No. 151,816
Int. Cl. B64d 33/04
U.S. Cl. 239—265.19 8 Claims

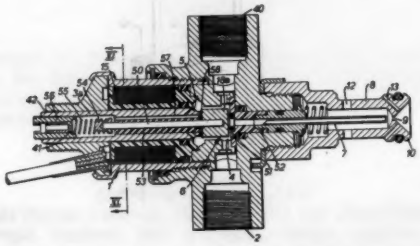


A nozzle assembly for gas turbine power plants, particularly aircraft jet engines, which incorporates a generally annular splitter dividing the nozzle into two parts and provided on its surface with suitable sound-absorbing material. Incorporated into the splitter and forming a part thereof is apparatus for varying the cross-sectional area of the nozzle exit and, hence, the operating characteristics of the power plant. This latter means preferably comprises a plurality of arcuate segments hinged to the splitter and actuable from a position where they are flush with the remainder of the splitter surface to extended positions where they effectively reduce the nozzle cross-sectional area. The assembly, therefore, performs two functions. First, it provides additional sound-absorbing area; and, secondly, it acts as a nozzle area control device.

3,721,390
FUEL INJECTION NOZZLES

Harold Ernest Jackson, Plymouth, England, assignor to Petrol Injection Limited, Plymouth, Devon, England

Filed Sept. 13, 1971, Ser. No. 179,961
Claims priority, application Great Britain, Sept. 25, 1970, 45823/70
Int. Cl. B05b 1/30
U.S. Cl. 239—585 18 Claims

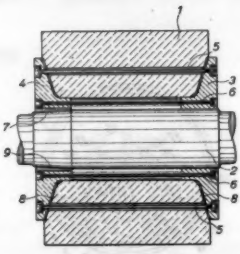


Fuel injector nozzles are described including electromagnetically-operable interrupter valves whereby the nozzles can be operated to discharge fuel intermittently. In one form, the movable valve member of the interrupter valve is spherical. In another form, a through-flow fuel path is provided to permit the continuous circulation of fuel through the nozzle even when the interrupter valve is closed, and a vapor separating path is provided to remove fuel vapor. In yet another form, a non-magnetizable element is provided to reduce operating delays in the interrupter valve as a result of residual magnetism.

3,721,391
ARRANGEMENT FOR FIXING THE GRINDING STONE IN A PUMP GRINDER

Aimo Emil Lepola, Kaipola, Finland, assignor to Yhtyneet Paperitehtaat Osakeyhtio, Kaipola, Finland

Filed Sept. 4, 1970, Ser. No. 69,712
Claims priority, application Finland, Aug. 12, 1970, 2,211/70
Int. Cl. B02c 13/26; B24d 5/16
U.S. Cl. 241—293 2 Claims



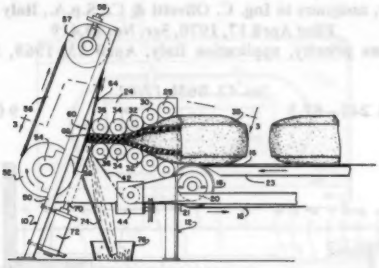
This invention relates to an improvement in an arrangement for fixing a wood-grinding stone on a shaft with the aid of two flanges pressing against it. According to the invention one of the two flanges is mounted on the shaft with shrink fit and the other flange, with force fit accomplished by driving the flange, provided with a tapering bore, upon the tapering shaft.

3,721,392

TIRE GRINDING FEED DEVICE

Stanley J. Burwell, Glen Arm, Md., assignor to Lyons Industries, Inc., Pikesville, Md.

Filed March 1, 1971, Ser. No. 119,516
Int. Cl. B02c *19/00*
U.S. Cl. 241—301 5 Claims



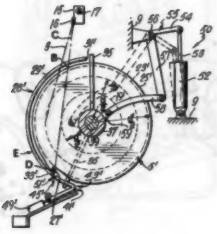
A tire grinding device comprising conveyor means for feeding a row of tires along a path of travel with converging feed roll means disposed adjacent one end of the conveyor means for squeezing a tire therebetween in a relatively flat configuration, and grinding means disposed adjacent one side of said feed roll means for pulverizing and grinding the tire as it is continuously fed between said feed roll means. The apparatus is provided with support means adjacent the lower portion of the feed roll means to support the edge of the tire as it is being pulverized by the grinding means.

3,721,393

METHOD AND APPARATUS FOR STRAND WINDING AND REELING

Joseph R. Marcel Croisettere, Fabreville, Laval, Quebec, Canada, assignor to Northern Electric Company Limited, Montreal, Quebec, Canada

Filed Oct. 22, 1970, Ser. No. 82,943
Int. Cl. B65h *54/02*
U.S. Cl. 242—25 A 10 Claims



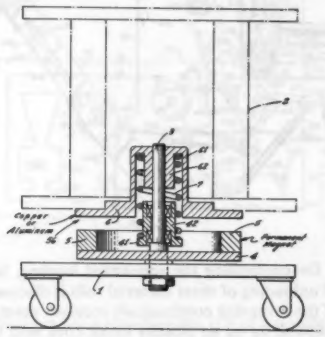
A method and apparatus for continuously winding strand material on alternate ones of a pair of side-by-side takeup reels. The reels are selectively rotated, and each has a strand snagger plate. When one reel is full, the strand is moved by suitable means toward the other reel for winding thereon without interrupting the feeding of the strand. The strand is caught by the snagger plate on the empty reel during changeover. A finger member is provided for preventing the strand from being caught by the snagger plate on the full reel.

3,721,394

APPARATUS FOR UNCOILING WIRE FROM A SPOOL

Hans Joachim Reiser, Hannover, Germany, assignor to Kabel- und-Metallwerke Gutehoffnungshutte Aktiengesellschaft, Hannover, Germany

Filed June 23, 1971, Ser. No. 155,938
Claims priority, application Germany, July 3, 1970, P 20 32 935.5
Int. Cl. B65h *59/16, 49/18*
U.S. Cl. 242—54 R 4 Claims



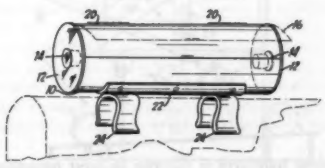
In an apparatus for uncoiling wire from a spool at constant speed and tension using an eddy current brake having a magnet and an electrically conductive disk for rotating in the magnetic field as provided by the magnet; for example, the magnet is mounted on a base, and the disk is or is part of the turntable supporting a spool from which wire is to be uncoiled. The turntable is axially spring biased and journalled for rotation about a vertical axis, whereby the effective air gap between the magnet and the disk is determined by resilient reaction of the spring to the weight of the spool. As wire is uncoiled, that weight decreases while the rotational speed of turntable and spool increase so that tension and withdrawal speed of the wire remain constant.

3,721,395

TOWEL RACK FOR VEHICLES

Rufus Snipes, 318 W. Pine St., Arcadia, Fla. 33821

Filed June 30, 1971, Ser. No. 155,676
Int. Cl. B65h *19/00*
U.S. Cl. 242—55.53 4 Claims

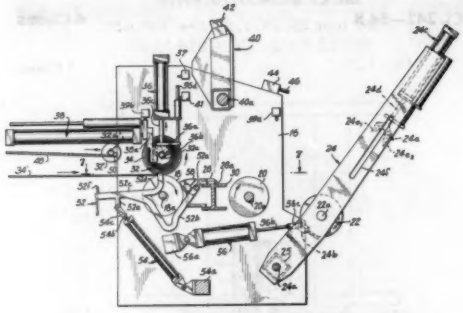


A rack for detachably holding a roll of paper towels and adapted to be detachably secured to the interior of a vehicle, the rack being provided with roll shielding means having hinged front and rear access doors through which towels can be removed individually.

3,721,396
SHEAR CUTTING BATCHER APPARATUS

Nicholas L. Morizzo, Cornwall, N.Y., assignor to Silk City Textile Machinery Co., Paterson, N.J.

Filed May 26, 1971, Ser. No. 147,064
Int. Cl. B65h 19/20
U.S. Cl. 242—56 R 28 Claims

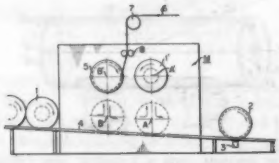


A system for controlling the sequential loading, build-up, severing and unloading of sheet material rolls is disclosed. The apparatus of the invention continuously receives sheet material, which is wound up on an initially blank core held between pressure cylinders and a drive roller. After a predetermined diameter of material has been built up on the core, it is transferred to a forward position where it is held between a pair of pivotable arms while material build-up continues. Following the transfer, the arms incline forward to prepare for unloading, and a new blank core slides into a ready position to subsequently receive a free end of the material. The material is precisely severed by an overhead blade carriage which rotates downward to shear the material between movable and stationary blade members. The forward free end of the material is wound up on the full core, which is now unloaded; the rear free end, now the leading edge of the continuously generated sheet material, is forced over and around the blank core, to which it adheres as a new build-up cycle commences.

3,721,397
AUTOMATIC REEL MOUNTING DEVICE FOR A CONTINUOUS WINDING MACHINE

Hiroshi Hori and Shoji Kosuge, Yokohama, Toshio Matsunaga, Yokosuka, and Eishichi Someya, Yokohama, Japan, assignors to Japan Steel Works Ltd., Tokyo, Japan

Filed Nov. 16, 1970, Ser. No. 89,944
Claims priority, application Japan, Nov. 25, 1969, 44/94,523
Int. Cl. B65h 17/02
U.S. Cl. 242—67.1 R 4 Claims

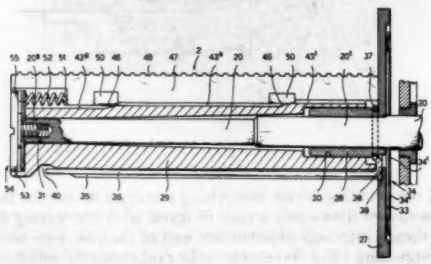


Empty reels rested on the inclined rails are automatically rolled down one by one upon receipt of a starting signal. In the course of such rolling the reel is stopped to rest on a reel-lift, which raises the reel to the position where it is held between drive and driven discs of a continuous winding machine to be rotated for taking up wire on it, while a fully taken up reel held between another set of discs of the machine is lowered by another reel-lift from the winding position of the machine onto the inclined rails and hence rolled down to a reel stacking area near the end of the rails.

3,721,398
DEVICE FOR REWINDING THE PAPER TAPE USED FOR WRITING IN CALCULATING MACHINES

Bruno Azzalin, Ivrea, and Francesco Bettini, Vicensa, both of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Italy

Filed April 17, 1970, Ser. No. 29,419
Claims priority, application Italy, April 23, 1969, 51546 A/69
Int. Cl. B65h 17/02
U.S. Cl. 242—67.3 9 Claims

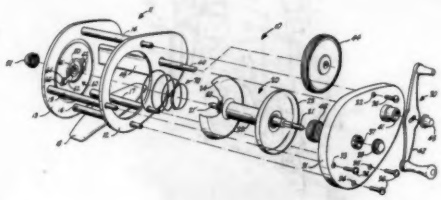


A device for winding up in a roll the print-out paper issuing from a calculating machine comprising a rotatable take-up roller having a cantilevered take-up spool. The spool includes an axially aligned slider mounted in a groove in the spool which engages the inside of the core of the tape being collected. The floor of the groove is inwardly inclined and the slider is movable laterally in the groove and radially inwardly along the inclined floor, whereby upon such movement the slider disengages from the tape and allows the tape to be removed from the spool.

3,721,399
BACKLASH-PROOF FISHING REEL

Walter Mroz, 8841 Winston Rd., Anaheim, Calif.

Filed Jan. 19, 1971, Ser. No. 107,620
Int. Cl. A01k 89/02
U.S. Cl. 242—84.51 R 4 Claims



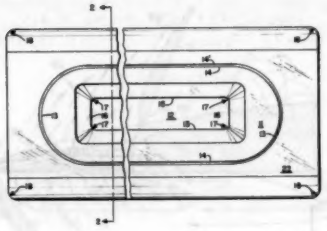
In a fishing reel of the type comprising a housing having spaced, parallel front and back plates, and a spool having a shaft connected between first and second spaced, parallel end plates, the spool being supported for rotation within the housing, the improvement wherein a spring, consisting of a plurality of coils of wire, each successive coil having a smaller diameter than the preceding coil, is positioned between the back plate of the housing and the adjacent end plate of the spool, the spring applying a force to the spool to prevent unlimited rotation thereof.

3,721,400

MAGNETIC CORE ASSEMBLIES

Harold M. Weissman, Lexington, Mass., assignor to Honeywell, Inc., Minneapolis, Minn.

Filed July 21, 1967, Ser. No. 655,124
Int. Cl. B65h 75/12
U.S. Cl. 242—118 4 Claims



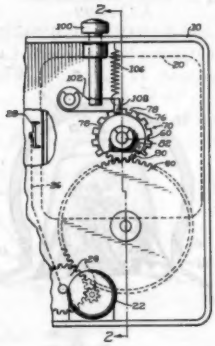
A magnetic core assembly and a method for its manufacture for use in a magnetometer. The core assembly is constructed from a two-piece bobbin. A method is provided for leaving spaces between the ferromagnetic winding and the bobbin to compensate for differences in the thermal coefficient of expansion of the bobbin and the ferromagnetic winding.

3,721,401

FILM TAKE-UP WITH RATCHET

Henry J. Koeber, Deerfield, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed Aug. 6, 1970, Ser. No. 61,572
Int. Cl. B11b 15/32; G03b 1/04
U.S. Cl. 242—207 9 Claims



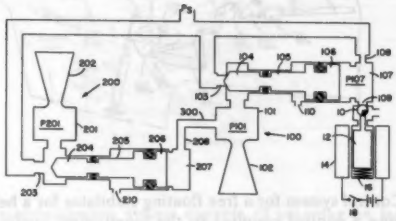
A unidirectional take-up drive mechanism of a camera of the type which accepts a film-loaded cartridge is provided with a dual path selective operable transmission whereby the take-up can be driven at a rate corresponding to film transport and at a rate slower than film transport. The dual transmission path connects the take-up with the mechanism drive to enable selection by a control of the ratio of the take-up drive to film transport rate or to slow down the rotation of the take-up so that it does not take up film as fast as the film is fed from the cartridge supply, thereby creating an excess of loosely wound film in the cartridge. The excess film may be rewound onto the supply, which film may be intentionally exposed a second time.

3,721,402

MISSILE ROLL CONTROL MECHANISM

Thomas M. Holland, Orlando, Fla., assignor to The United States of America as represented by the Secretary of the Army

Filed June 25, 1971, Ser. No. 156,627
Int. Cl. F41g 7/00; G05d 11/00
U.S. Cl. 244—3.22 4 Claims



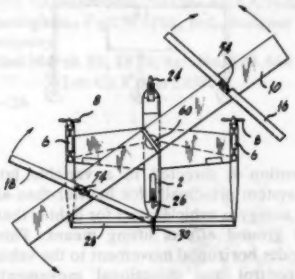
A mechanism for controlling the roll of a missile in flight by selective operation of a pair of missile thrusters. Each thruster has a valve to control the flow of gas thereto. The operation of one of the valves is controlled by a pilot valve and operation of the other valve is controlled by pressure feedback from operation of the first thruster.

3,721,403

ROTOGYRO

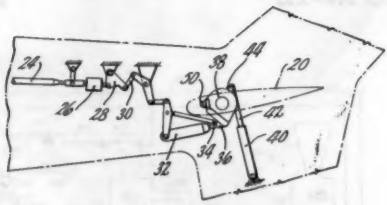
R. Flanagan Gray, RD No. 1, Washington Crossing, Pa.; John Caswell, 125 South Chancellor Street, Newtown, Pa., and William G. Muller, 131 N. Delaware Avenue, Yardley, Pa.

Filed Oct. 8, 1970, Ser. No. 79,247
Int. Cl. B64c 27/22
U.S. Cl. 244—7 A 11 Claims



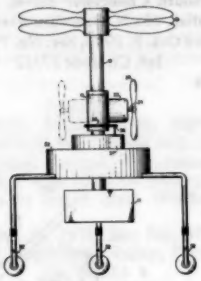
An improved type of aircraft is provided with a rotatable wing having autogyro blades mounted near the ends thereof while having a stationary wing and propeller for horizontal flight. The rotatable wing also serves as an airfoil during horizontal flight but is operable with its autogyro blades during take off and landing to provide greatly increased lift for a given horsepower. The power plant used for driving the rotatable wing and propeller is variably coupled thereto in a manner to attain the most efficient utilization of power under all conditions of flight.

3,721,404
HELICOPTER FLOATING STABILATOR CONTROL SYSTEM
Aristide A. Albert, Stratford, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.
Filed Nov. 10, 1971, Ser. No. 197,253
Int. Cl. B64c *27/04*
U.S. Cl. 244—17.19 **8 Claims**



Control system for a free floating stabilator for a helicopter having a control coupling to the longitudinal cyclic control linkage with provision for freeing the stabilator from controlled movement during flight operation such as hover so that the stabilator can assume a position providing minimum vertical drag.

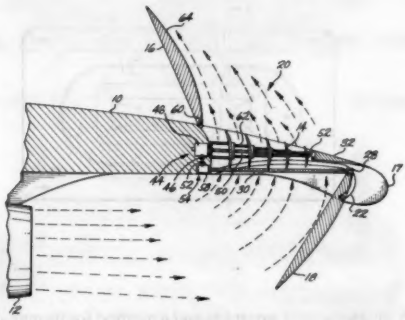
3,721,405
AZIMUTHAL PROPULSION-CONTROL SYSTEM
Janko Jackson, 200 Panorama Drive, Oxon Hill, Md.
Filed May 13, 1970, Ser. No. 36,831
Int. Cl. B64c *27/82*
U.S. Cl. 244—17.21 **2 Claims**



This invention is directed to a variable lateral-attitude propulsion system principally for heavier-than-air craft such as powered autogyro vehicles, and for lighter-than-air craft as well as for ground effects lifting means. This propulsion system provides horizontal movement to the vehicle as well as azimuthal control and directional movement along the horizontal, all without the use of a conventional rudder.

3,721,406
AIRCRAFT WING AIRFLOW CONTROL SYSTEM
Clifford F. Hurlbert, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.
Filed Dec. 14, 1970, Ser. No. 97,632
Int. Cl. B64c *9/18*
U.S. Cl. 244—42 D **10 Claims**

A system for controlling flow through a passageway located in the aft 30 percent chord region of an aircraft wing airfoil to change the aerodynamic flow pattern during ground roll conditions, and thereby spoil lift, generate a downwardly acting force to increase the effective aircraft weight on the wheels, increase drag, and create thrust reversal by redirection of engine exhaust gases. The preferred embodiments involve unique flap means which may be actuated into position to intercept flow beneath the wing and turn the flow upwardly through the passageway. Disclosed flap members include a modified Fowler flap with provision for increased rotation forwardly to an acute angle with respect to the wing, and several optional cascade vane flap devices. An improved spoiler member incorporating an aft facing convex surface is also presented.



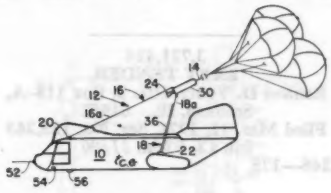
3,721,407
AIRCRAFT CANOPY SEPARATION SYSTEM
James A. Clarke, Plainview, N.Y., assignor to Fairchild Industries, Inc., Montgomery County, Md.
Filed Feb. 12, 1970, Ser. No. 10,861
Int. Cl. B64c *1/14*
U.S. Cl. 244—121 **10 Claims**

An aircraft canopy separation system including a frangible member that can comprise tempered glass or a glass ceramic that is connected to the aircraft canopy at a location that will permit the opening or removal of the canopy after the frangible member has disintegrated as a result of being struck by a sharp instrument. The frangible member comprises a rod that is located within a hinge that is attached to the canopy. A sharp-pointed instrument is also provided for striking the frangible member that may be located on an aircraft ejection seat at a point where it will strike the frangible member as the ejection seat is being ejected from the cockpit of the aircraft.

3,721,408
VARIABLE MODE SLING FOR HELICOPTER RECOVERY SYSTEMS

Gene R. Drew, El Centro, Calif., and Bobby C. Layman, Dahlgren, Va., assignors to The United States of America as represented by the Secretary of the Navy

Filed Nov. 19, 1971, Ser. No. 200,387
Int. Cl. B64d *17/38*
U.S. Cl. 244—139 7 Claims

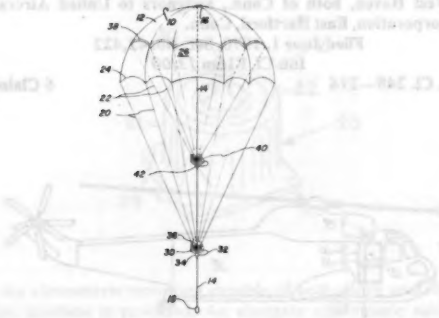


A sling design for recovery of airborne loads, such as helicopters disabled in flight, having a variably geometry automatically programmed so that if recovery is necessary when the aircraft is disabled at high speed the sling geometry is selected to reduce the trim angle and avoid excessive pitching, and when the helicopter speed is sufficiently retarded the sling geometry is changed to a low speed configuration. In a final mode, as soon as the recovered helicopter makes contact with the ground the entire sling apparatus is automatically jettisoned.

3,721,409
CONTROLLED MULTI-STAGE DECREASING DRAG PARACHUTE

Jon T. Matsuo, and Lawrence E. Neipling, both of El Centro, Calif., assignors to The United States of America as represented by the Secretary of the Navy

Filed June 25, 1971, Ser. No. 156,750
Int. Cl. B64d *17/08*
U.S. Cl. 244—152 8 Claims

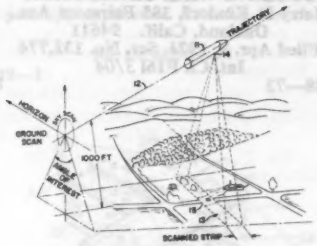


A controlled multi-stage decreasing drag parachute wherein the cloth portion of the canopy is provided with a centerline connecting the apex thereof to the load and one or more sets of suspension lines being connected at their upper ends to respective spaced points about the periphery and their lower ends slidably restrained around the centerline, the restraining means being releasable upon the application of a predetermined force to reduce the parachute drag area.

3,721,410
ROTATING SURVEILLANCE VEHICLE

William B. Anspacher, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Navy

Filed Aug. 29, 1962, Ser. No. 220,948
Int. Cl. F41g *7/00*; F42b *13/30*; F41g *9/00*
U.S. Cl. 244—3.14 1 Claim



1. A reconnaissance system capable of scanning an inaccessible target area and relaying the information to an observation point where it is displayed for visual observation comprising an infrared transducer means for converting detected infrared radiations into electrical signals proportional to the detected infrared radiations, transmitting means connected to said transducer means for transmitting electrical signals, rotating projectile means rotating at a predetermined rate enclosing said transmitting means and having said transducer means fixedly attached to the outer periphery of the projectile for scanning in a helical path the target area in a fixed rotating relationship with the projectile, at a rate equal to the rotating rate of said projectile receiving means for receiving and demodulating said electrical signals, and visual display means connected to said receiving means for converting electrical signals into a visual representation of the target area.

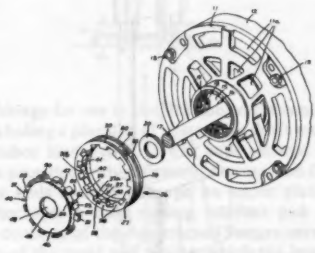
ERRATUM

For Class 244—3.11 see:
Patent No. 3,721,420

3,721,411
RESILIENT MOTOR MOUNTING ARRANGEMENT

Eldon R. Cunningham, Fort Wayne, Ind., assignor to General Electric Company

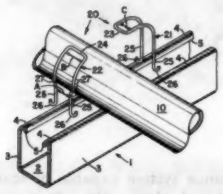
Filed March 30, 1971, Ser. No. 129,444
Int. Cl. F16m *13/00*
U.S. Cl. 248—26 3 Claims



A resilient mounting arrangement for a rotating machine, such as a motor, includes an annulus of resilient material having an inner region forming a bore with a number of recesses extending outwardly from the bore. A rigid member is pro-

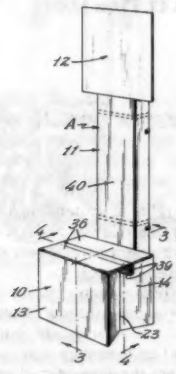
vided to be positioned within the bore and to be in engagement with the rotating machine. The rigid member includes a number of spaced apart tabs which are received in corresponding recesses and have opposed lateral surfaces for engaging the resilient material forming the recesses. At least some of the tabs are nonplanar to increase the effective length of their lateral surfaces within the recesses.

3,721,412
LOCKING WIRE CINCH STRAP
Harry L. Kindorf, 385 Fairmont Ave., Oakland, Calif. 94611
Filed Apr. 9, 1971, Ser. No. 132,774
Int. Cl. F16l *3/04*
U.S. Cl. 248—73 **8 Claims**



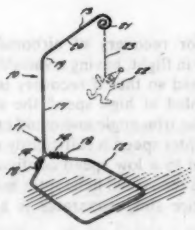
A pair of curved U-shaped wire members with hooks on their distal ends cooperate to form a wire strap that has its members secured to a cooperating support through their hooks and interengaged around a conduit contiguous to the support by threading the loop end of the male U-shaped member through the wider loop end of the female U-shaped member of the pair, thereafter tightening the lapped ends of the U-shaped members about the conduit by applying pressure between these ends and subsequently locking the members by bending the loop end of the male member away from the conduit so it wraps about the loop end of the female U-shaped member, thereby cinching the conduit to the support with the two piece wire strap.

3,721,413
DISPLAY STAND
William J. Robinson, Saint Paul, Minn., assignor to Reynolds Guyer Agency of Design, Ramsey County, Minn.
Continuation of Ser. No. 761,934, Sept. 24, 1968, abandoned. This application Jan. 18, 1971, Ser. No. 143,590
Int. Cl. A47f *5/11*
U.S. Cl. 248—174 **3 Claims**



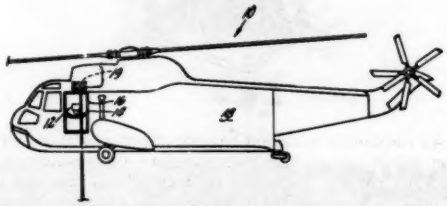
A display is provided which may be folded into a generally flat form and which will automatically fold into erected form when means holding the display folded is released. The display includes a display body, a standard, and a display card. The display body is expandable and contractable. The standard is secured to extend upwardly from the display body, and is channel-shaped when erected. The display card is secured to the upper end of the standard. The standard is vertically elongated and is creased to provide an intermediate panel and two side panels. The standard is transversely foldable to enclose the display body in collapsed form. Resilient means are provided for expanding the display body and for folding the side pannels in right angular relation to said intermediate panel when means holding the display collapsed and folded is released.

3,721,414
BABY TENDER
Reuben D. Yoder, Rte. 2, Box 118–A, Sullivan, Ill. 61951
Filed Mar. 11, 1971, Ser. No. 123,263
Int. Cl. F16m *11/00*
U.S. Cl. 248—175 **1 Claim**



A depending toy for amusing an infant while lying on his back, the frame being made of wire material and including a flat base positioned below the infant, the base supporting a removable upright member which at its upper end includes a hook to which the toy can be attached.

3,721,415
UNIVERSALLY MOVABLE MOUNTING MECHANISM WITH LOCKING AND UNLOCKING PROVISIONS AND WHEREIN THE UNLOCKING PROVISIONS ARE OPERABLE IN ACCORDANCE WITH OPERATOR FEEL
John Steven Chapkovich, Jr., Milford, and David Ernest Lee, West Haven, both of Conn., assignors to United Aircraft Corporation, East Hartford, Conn.
Filed June 1, 1970, Ser. No. 42,422
Int. Cl. F16m *13/00*
U.S. Cl. 248—214 **6 Claims**



A universally movable mounting mechanism in which the mounting mechanism is connected to a fixed ball by spherically shaped friction cups which are spring biased toward one another to lock the mounting mechanism in fixed position on the ball and which can be selectively moved away from one another to either totally eliminate the friction between the friction cups and the ball to thereby free the mounting mechanism for universal motion in response to actuation by a

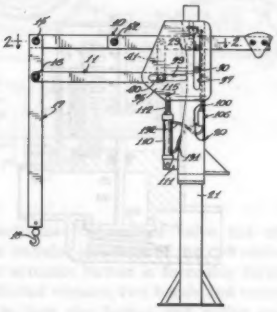
pilot operated handle or in which the friction between the friction cups and the fixed ball is selectively reduced so as to maintain a desired mount positioning force in accordance with operator feel as he moves the mounting mechanism through handle motion.

3,721,416

LOADING BALANCER

Noel G. Goudreau, Mendota, Ill., assignor to Conco Inc.

Filed Dec. 4, 1970, Ser. No. 95,045
Int. Cl. A47f 5/00
U.S. Cl. 248—325 **13 Claims**



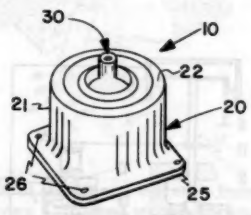
A loading balancer having a two-stage balancing control for the multi-arm balancing system wherein a first stage is sensitive to a force applied to a load on the load support arm to control a second stage control having sufficient power to adjust the position of the load and the balancer mechanism in the same direction as the applied force.

3,721,417

ELASTOMERIC COMBINATION SHOCK AND VIBRATION ISOLATOR

Dennis P. Skala, and Richard P. Thorn, both of Erie County, Pa., assignors to Lord Corporation, Erie, Pa.

Filed April 9, 1971, Ser. No. 132,863
Int. Cl. F16f 15/00
U.S. Cl. 248—358 R **13 Claims**



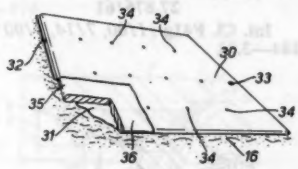
An elastomeric mounting capable of both shock and vibration isolation is provided. An elongate elastomeric tubular buckling column, preferably right cylindrical, has one end adapted to be connected to a supporting structure. Means is disposed axially of the buckling column capable of movement axially therewithin for connection to the supporting structure. An elastomeric member is secured between the buckling column and connection means mounting the connection means for resilient movement axially and radially of and within the buckling column with the connection means normally extending axially outwardly of or beyond the other end of the buckling column for normally supporting the supported structure in axially spaced relation to the buckling column. The elastomeric member has a spring rate axially of the buckling column less than the initial axial spring rate of the buckling column.

3,721,418

NATURAL ICE RINK MOULD

Eric F. Vincent, 641 Geneva Park Drive, Burlington, Ontario, Canada

Filed Feb. 25, 1970, Ser. No. 14,061
Claims priority, application Canada, March 25, 1969, 46,709
Int. Cl. B28b 7/34
U.S. Cl. 249—1 **4 Claims**



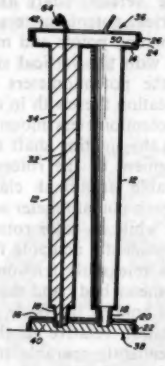
A "one-shot" mould for forming natural ice rinks is provided. It includes a pair of sheets of synthetic thermoplastic material, e.g. polyethylene, whose peripheral edges are sealed together. The bottom of the two sheets is water-tight and can conform to the shape of an irregular surface. The top has a water inlet aperture, and preferably also more holes to permit the escape of entrapped air as water fills the enclosure.

3,721,419

WICK HOLDING ATTACHMENT FOR CANDLE MOLDS

Donald B. Bolinger, R.R. No. 2, Bloomington, Ill.

Filed March 13, 1970, Ser. No. 19,428
Int. Cl. C11c 5/00
U.S. Cl. 249—93 **2 Claims**



An assemblage for use in conjunction with a candle mold of the type including a plurality of upstanding downwardly tapering mold tubes having their lower ends secured through a lower plate provided with peripheral downturned flanges and their upper ends secured through an upper plate. The attachment includes a fluid sealing resilient pad receivable within the confines of the downturned flanges carried by the lower plate of the mold and against which the lower ends of the mold tubes are end edge engaged for sealing the lower ends of the tubes against the flow of molten wax therefrom and for clamping the lower ends of wick strings projecting out of the lower ends of the mold tubes, the lower ends of the wick strings being clamped between the end edges of the mold

tubes and the resilient pad. The attachment further includes structure supported from the upper plate and removably positionable in registry with the centerlines of the tubes and above the latter and to which the upper ends of wick strings extending through the tube may be secured so as to ensure that the upper and lower ends of the wick strings will be suitably anchored as well as centered relative to the tubes.

3,721,420

SIGHTING MEANS FOR MISSILES

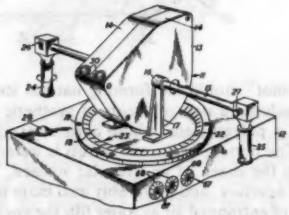
Brian Ford and Malcolm Clapp, Heston, England, assignors to British Aircraft Corporation (A.T.) Limited, Bristol, England

Filed Aug. 1, 1962, Ser. No. 214,468

Claims priority, application Great Britain, Aug. 1, 1961, 27,876/61

Int. Cl. F41g *11/00, 7/14, 9/00*

U.S. Cl. 244—3.11 **4 Claims**



1. A sighting device for use in combination with a computer for programming the flights of a battery of guided missiles with a plurality of launching points displaced from the position of the sighting device, comprising in combination a visual sight mounted on a vertical sighting shaft journalled in a fixed support for rotation of the sight about the vertical shaft axis, a plurality of ganged rotary electrical potentiometers respectively associated with the launching points and mounted one above the other coaxially with the vertical sighting shaft, having rotors of all the potentiometers connected to the sighting shaft for rotation therewith in unison, and having the bodies of the potentiometers mounted one above another coaxially with the sighting shaft to rotate therewith by frictional engagement of the rotors with the bodies, independently actuable frictional clamping means to clamp the body of each potentiometer selectively in a preset angular position while its rotor rotates with the sighting shaft, said independently actuable frictional clamping means comprising a releasable friction brake acting between each potentiometer body and the fixed support, the brake when engaged holding the body in a given angular position against rotation relative to the support, and a separate and independently-operable motor means associated with each friction brake and operable to engage and release said brake, a separate friction brake in permanent but slippable engagement between each potentiometer body and the said sighting shaft to augment the frictional torque transmissible between the shaft and the body of the potentiometer via its rotor, each said separate friction brake causing its associated potentiometer body to rotate with the shaft when the associated releasable friction brake is disengaged, a stop member on each potentiometer body and a co-operating abutment on the fixed support arranged to be engaged by the stop member to limit the angular rotation of each potentiometer at an extreme datum position, and electric circuit means connected with said potentiometers to supply programming information to the computer for effecting automatic parallax corrections for respective launching points responsive to the position of the sighting shaft.

3,721,421

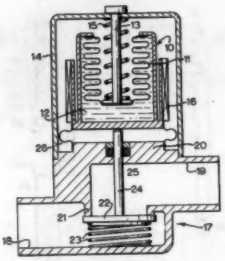
THERMAL ACTUATORS

Thomas Charles Cliff, Sunbury-on-Thames, England, assignor to United Gas Industries Limited, London, England

Filed Nov. 12, 1970, Ser. No. 88,706

Int. Cl. F03g *7/06*; F16k *31/04*

U.S. Cl. 251—11 **9 Claims**



A thermal actuator comprising a sealed container of thermally-conducting material containing a liquid and including a thermally responsive element and an actuating member; a heater in heat exchange relationship with the container; and a heat sink.

3,721,422

PNEUMATIC PRESSURE POSTION ADJUSTING CONTROLLER

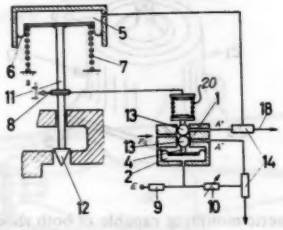
Horst Bader, 7000 Stuttgart 80, Germany, assignor to J. C. Eckardt AG, Stuttgart, Germany

Filed March 25, 1971, Ser. No. 128,042

Claims priority, application Germany, March 25, 1970, P 20 14 308.2

Int. Cl. F16k *31/145*; G05d *16/00*; F15b *5/00*

U.S. Cl. 251—28 **1 Claim**

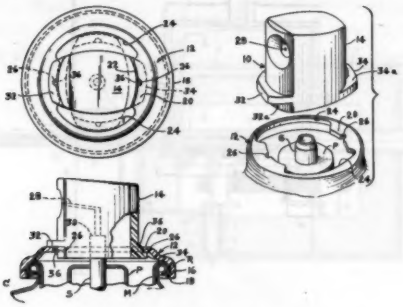


A pneumatic pressure position adjusting controller which includes a differential pressure amplifier providing first and second output pressures from a comparison unit responsive to pressures provided by the first and second pressure chambers, the second output pressure from the differential pressure amplifier being compared to an input pressure by a pressure distributor which applies a control pressure to the second pressure chamber, the first output pressure of the differential pressure amplifier being applied to the first pressure chamber.

3,721,423
CHILDPROOF ACTUATOR FOR AEROSOL VALVE

Joseph John Shay, Manchester, N.H., assignor to Scovill Manufacturing Company, Waterbury, Conn.

Filed Dec. 17, 1971, Ser. No. 209,125
Int. Cl. F16k *35/04*
U.S. Cl. 251—100 4 Claims

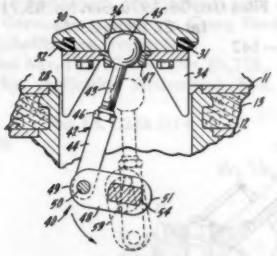


Childproof actuator for aerosol valve has collar easily rotatable on the annular structure of the can surrounding the valve stem. An actuator button is forceably turnable within collar. In a preferred version, two hands and mature strength are necessary to turn the button and collar relatively. To prepare valve for operation, button must have its blocking surfaces non-aligned with interfering portions of top wall of collar.

3,721,424
CRANK OPERATED TANK BOTTOM PLUG VALVE

Richard J. Vanderlinden, Glenwood, Ill., assignor to Union Tank Car Company, Chicago, Ill.

Filed June 14, 1971, Ser. No. 152,933
Int. Cl. F16k *1/00, 31/52*
U.S. Cl. 251—144 8 Claims



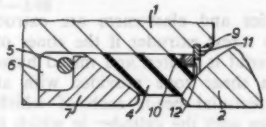
The outlet valve of the present invention includes a valve body member having a first and second opening associated therewith. A plug type valve member is positioned above the first opening and is vertically moveable between a closed position, wherein the valve member is in contact with a valve seat associated with the first opening, and an opened position, wherein the valve member is spaced from the valve seat. An operator means is provided for moving the valve member between its opened and closed positions which includes a unique linkage arrangement having a first position wherein the valve member is in its open position and a third position wherein the valve member is in its closed position and the linkage members are in a locked position.

One of the linkage members includes means to adjust the length thereof to compensate for manufacturing tollerances and component wear. Guide wings are provided to ensure that the valve member accurately contacts the valve seat when the vale member is in its closed position. The operator means is secured to the valve member by a ball and socket arrangement to permit the valve member to rotate about a substantially vertical axis so as to prevent uneven wear of the valve seat and valve gasket.

3,721,425
SEAT ASSEMBLY FOR BALL VALVES

Gerald Cedric Jones, and Herbert Bentley Leek, both of Hereford, England, assignors to Saunders Valve Company Limited, Cwmbran, Monmouthshire, England

Filed Aug. 16, 1971, Ser. No. 171,897
Claims priority, application Great Britain, Aug. 26, 1970, 41,011/70
Int. Cl. F16k *11/04*
U.S. Cl. 251—174 3 Claims

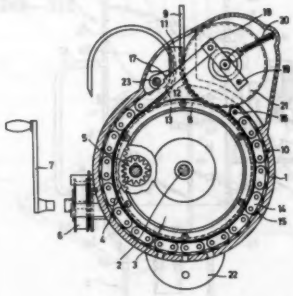


A ball valve of the type having a ball with a flow passage therethrough rotatably mounted in a bore in a valve casing in engagement with seating rings of extrudable material disposed on opposite sides of the ball and urged into sealing contact with the ball by spring-urged backing rings having conical surfaces confronting similar conical surfaces of the seating rings wherein at least one of the seating rings is limited in its movement in a direction towards the ball by abutment with a circlip received partially in a recess in the wall of the bore and projecting into said bore.

3,721,426
CABLE WINCH

Carl Kaufer, D5291 Kupferberg, near Wipperfurth, Germany

Filed July 8, 1971, Ser. No. 160,621
Claims priority, application Germany, Aug. 25, 1970, P 20 41 993.6
Int. Cl. B66d *1/00*
U.S. Cl. 254—167 6 Claims



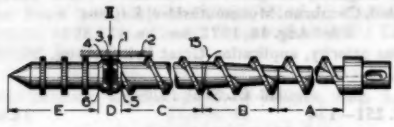
A cable winch, particularly for scaffolds, comprising a housing and a driving pulley mounted for rotation within the housing and around which pulley the cable passes. A flexible contact-pressure element attached by one end to the housing presses the cable against the driving pulley over a contact angle of more than 180°. The contact-pressure element is responsive to the load applied to the cable whereby an increase in load increases the contact-pressure applied by the element to the cable, and vice-versa.

3,721,427

EXTRUDER FOR WORKING ON THERMOPLASTIC MATERIALS AND NON-CROSS-LINKED ELASTOMERIC MATERIALS

Hartmut Upmeier, Tecklenburg, Germany, assignor to Windmoller & Holscher, Lengerich, Westphalia, Germany

Filed Apr. 20, 1971, Ser. No. 135,604
Claims priority, application Germany, Apr. 22, 1970, P 20 19 522.6
Int. Cl. B01f 7/08
U.S. Cl. 259—191 8 Claims



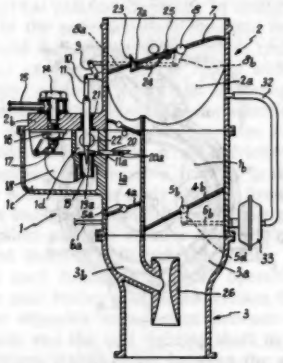
Thermoplastics and elastomers are extrudable more rapidly from a screw extruder if the zones of the screw where the material is melted and mixed have interposed therebetween a shear zone provided with at least two spaced circumferential beads each of which defines a narrow flow gap with the cylinder in which the screw is rotatable, a further bead which is a sealing fit in the cylinder being provided between the gap-defining beads. A circumferentially extending flow passage is provided between the further bead and each gap-defining bead, the first flow passage (as viewed length-wise of the screw) communicating with the mixing zone through at least one discharge passage and the second flow passage communicating with the melting zone through at least one supply passage.

3,721,428

CONSTANT NEGATIVE-PRESSURE CARBURETTORS

Pierre Gele, Route de Lourdes 65, Odos Tarbes; Bernard Laprade, and Xavier Laprade, both of 64 Arudy, all of France

Filed Nov. 22, 1971, Ser. No. 199,247
Claims priority, application France, Nov. 20, 1970, 7041730
Int. Cl. F02m 11/02
U.S. Cl. 261—23 A 6 Claims



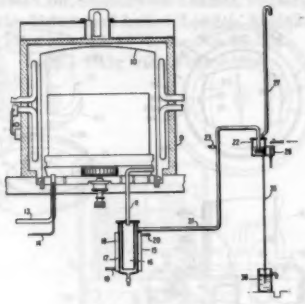
Constant negative-pressure carburettor to minimize exhaust pollution of internal combustion engines comprising a main conduit having a main valve and an auxiliary conduit having a main valve actuated from the exterior and an additional valve, the proportional fuel flowing between the two valves, an additional complementary valve being provided so as to cap the main conduit and the auxiliary conduit, the valve being connected to the fuel-proportioning needle.

3,721,429

EXHAUST SYSTEM FOR FURNACE RETORT

Harold K. Young and Herbert Wald, Baltimore, Md., assignors to Bethlehem Steel Corporation

Filed Oct. 30, 1967, Ser. No. 678,829
Int. Cl. B01d 47/02
U.S. Cl. 261—123 4 Claims



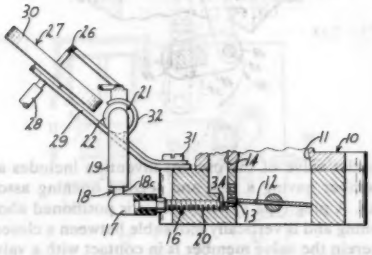
A system for scrubbing waste gas from a metal treating retort and regulating the pressure in the retort includes apparatus for withdrawing the gas from the retort and cooling the gas. The cooled gas is transferred to a liquid sealing vessel containing a gas diffusing structure, gas exhaust tube, liquid discharge tube leading to a secondary seal or drain, and a communicating liquid leveling vessel. The leveling vessel is equipped with an adjustable drain and an inlet for introducing fresh liquid.

3,721,430

FUEL PREPARATION SYSTEM FOR CARBURETOR

Porter Landrum, Birmingham, Ala., assignor to Porter Landrum; Edward Y. McMorris; Porter Landrum, Jr., all of Birmingham, Ala.; Mrs. William Null, Salina, Kans.; Mrs. Marshall Timberlake and Mrs. Willie Mae McMorris, both of Birmingham, Ala., part interest to each

Filed Oct. 26, 1970, Ser. No. 83,718
Int. Cl. F02m 23/14
U.S. Cl. 261—142 9 Claims

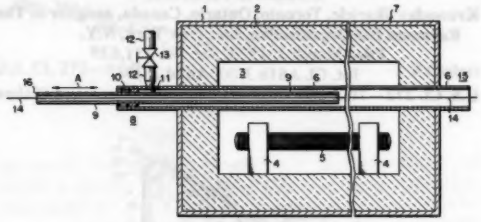


Air supply conduit of predetermined dimensions communicates with each idle port of carburetor with means heating air which passes through conduit to a predetermined temperature. Lateral openings in air supply conduit adjacent idle port receives fuel from fuel supply passageway to supply heated mixture of fuel and air to idle port.

3,721,431
APPARATUS FOR ANNEALING EXTREMELY FINE WIRES WITH STEAM

Tokutaro Nishida, Ashikaga-shi, Tochigi-ken, Japan, assignor to Nippon Seisen Cable, Ltd., Tokyo, Japan

Filed Sept. 22, 1971, Ser. No. 182,617
Int. Cl. C21d 9/56
U.S. Cl. 266—3 R 1 Claim

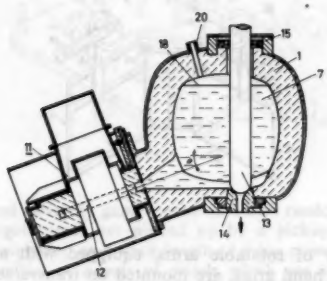


An apparatus for annealing extremely fine wires with steam wherein there is provided an annealing tube penetrating the heating chamber of an annealing furnace provided with an electrical heater; into the outlet side of the annealing tube is slidably inserted a cooling tube so as to have the length of its outward extending portion varied; the interspace between both tubes is sealed at said outlet end; the interspace between both tubes and the cooling tube are filled with steam introduced from the outlet side of the annealing tube; under this condition, an extremely fine copper wire is made to travel from the inlet of the annealing tube to the outlet of the cooling tube, thereby providing a very fine bright annealed wire with a clean surface which is sufficiently soft to afford good workability.

3,721,432
APPARATUS FOR RECEPTION AND DISCHARGE OF LIQUID METAL

Erwin Buhrer, Schaffhausen, Switzerland, and Anton Alt, Metzkausen, Germany, assignors to Georg Fischer Aktiengesellschaft, Schaffhausen, Switzerland

Filed Nov. 16, 1970, Ser. No. 89,778
Claims priority, application Switzerland, Nov. 18, 1969, 17131/69
Int. Cl. C21b 7/14
U.S. Cl. 266—38 13 Claims

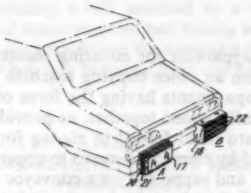


A heating means and a feed container having a feed cavity therein are both coupled to a container which is adapted to receive and discharge liquid metal. The reception and discharge container includes a valve operated opening for selectively pouring out the liquid metal. A feed channel is provided between the lower end portions of the feed cavity and the container cavity such that liquid metal poured into the feed cavity flows into the container cavity through the feed channel. The feed container has a wall the height of which is equal to the maximum level of liquid metal in the container cavity such that when the liquid metal reaches the desired maximum level, the excess liquid metal is poured off over the wall.

3,721,433
DEFORMABLE SHOCK-ABSORBING GUARD

Leonard H. Sobel, Rockaway Park, N.Y., assignor to Collision Devices, Inc.

Continuation-in-part of application Ser. No. 792,737, Jan. 21, 1969. This application Nov. 21, 1969, Ser. No. 878,657
Int. Cl. F60r 9/00; F16d 63/00; F16f 13/00
U.S. Cl. 267—140 7 Claims

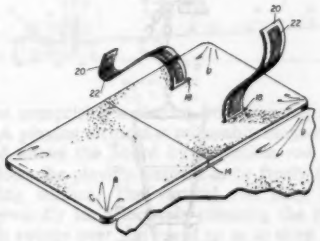


Energy-absorbing crash or collision devices for vehicles or the like to reduce shock of collision by utilizing energy-absorbing components which are flexible and compressible and/or rigid, frangible and crushable, which components may be used singly or in combination, to effect gradual deceleration upon collision. A resilient or rigid but yieldable housing encases the energy-absorbing components.

3,721,434
INFANT CHANGING BOARD

Lillian S. Spies, Los Angeles, Calif., assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Jan. 8, 1971, Ser. No. 105,496
Int. Cl. A61g 13/00
U.S. Cl. 269—328 2 Claims

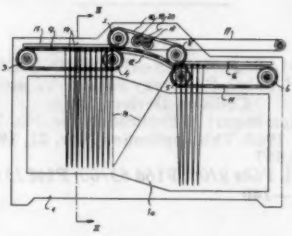


A convenient, foldable device on which an infant may be placed and held while changing the diaper or clothing of the infant which is relatively compact, small and easily carried when folded and which in the operative position provides a surface large enough to place the infant and means for securing the infant onto such surface during the changing and also includes at least one plastic or soil-proof integrally attached apron on which the soiled diaper may be placed during the process of changing and on which other accessories normally used in changing the diaper may be placed.

3,721,435
APPARATUS FOR COLLATING SHEETS

Jan H. P. A. Zanders, Venlo, Netherlands, assignor to Oce-van der Grinten N.V., Venlo, Netherlands

Filed Aug. 16, 1971, Ser. No. 171,954
Claims priority, application Netherlands, Aug. 14, 1970, 7012051
Int. Cl. B65h 29/58
U.S. Cl. 271—64 12 Claims

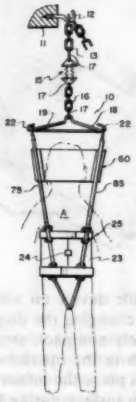


A simple apparatus for collating sheets such as copies being fed from an office copying machine makes use of a series of compartments having the form of suspended file folders mutually joined together, as provided for example by a cardboard band folded in zig-tag form. The folders are suspended by elements secured to upper edges or upper folds thereof and supported on a conveyor extending from either side of the sheet feed path, and are opened successively across that path by means which transfer the suspending elements successively to a conveyor supporting them at the other side of the feed path. The support conveyors and the transfer means may each comprise a flight of a system of notched belts. One of the support conveyors is disposed at a lower level than the other so that a certain panel of each opened folder will lie oblique to the other panel thereof, causing all sheets in the folder to rest against the oblique panel.

3,721,436
EXERCISER AND WALKER APPARATUS

Curtis Wallace Barthel, Jr., 114 South Humphrey, Oak Park, Ill.

Filed Dec. 4, 1970, Ser. No. 95,234
Int. Cl. A61h 3/00
U.S. Cl. 272—70 14 Claims

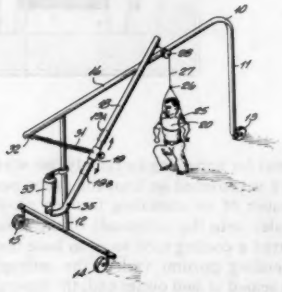


An exerciser and walker apparatus including a guide track for guiding the movement of the apparatus, a movable dolly assembly carried by the guide track to provide movement along the guide track, a mounting bar supported by and spaced from the movable dolly assembly, a harness assembly mounted on the mounting bar for accommodating the torso of the user disposed therein, and tension means interposed between the movable dolly assembly and the mounting bar for counterbalancing the weight of the user carried by the harness assembly.

3,721,437
WALKING TRAINER

Krunoslav Skaricic, Toronto, Ontario, Canada, assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed March 3, 1972, Ser. No. 231,629
Int. Cl. A61h 3/00; A47d 13/04
U.S. Cl. 272—70.3 4 Claims

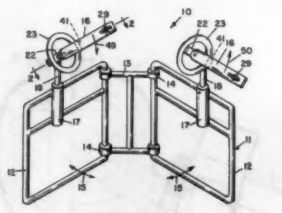


A training device for a young child, accident victim or such other person who requires assistance in learning to walk. The device, mounted on wheels, suspends the trainee in a harness, with a shock absorber and tension spring acting to counterbalance the suspended harness. The shock absorber action is adjustable to vary the rate of falling so as to correspond to the weight of the trainee, and his degree of attained walking skill.

3,721,438
SWIMMING EXERCISERS

Kasimir C. Kusmer, Aurora, Ill., assignor of a fractional part interest to Paul L. Romack, Aurora, Ill.

Filed July 21, 1970, Ser. No. 56,876
Int. Cl. A63b 69/10
U.S. Cl. 272—71 10 Claims



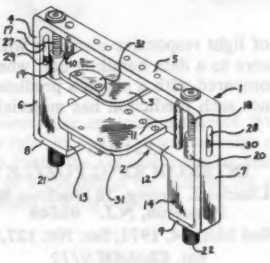
A pair of rotatable arms, equipped with universally mounted hand grips, are mounted on transversely spaced side members of a frame so that a user standing between the frame side members and facing toward the front of the frame may revolve the arms in a manner simulating arm movement when swimming. The arms revolve in oblique planes which are forwardly convergent and upwardly divergent relative to the frame, the forward convergence and upward divergence of such planes being

angularly adjustable. The transverse spacing of the frame side members is also adjustable, as is the distance of the hand grips from the axes of rotation of the arms. Free revolving movement of the arms is restricted by frictional brake means.

3,721,439
JAW EXERCISING DEVICE

Hans Rudolph, Kansas City, Mo., and Richard C. Ye, Shawnee Mission, Kans., assignors to Hans Rudolph, Inc., Kansas City, Mo.

Filed Nov. 27, 1970, Ser. No. 93,246
Int. Cl. A63b *21/00*
U.S. Cl. 272—83 R **5 Claims**

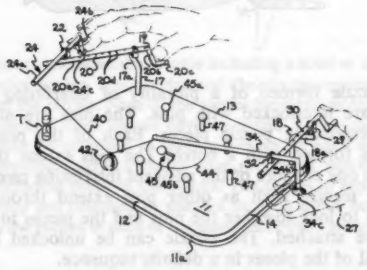


A jaw exercising device for use in exercising facial muscles has a gripping member mounted on and extending from a frame and a gripping member extending from a member movable within the frame in response to movement of a jaw of a person biting the gripping members, the movement being controlled by a resilient member urging the movable member away from an abutment portion of the frame member.

3,721,440
MANUAL DEXTERITY GAME

Howard M. Burns, 344 E. Hardin St., Findlay, Ohio

Filed Oct. 18, 1971, Ser. No. 189,815
Int. Cl. A61b *5/16*
U.S. Cl. 273—1 R **6 Claims**

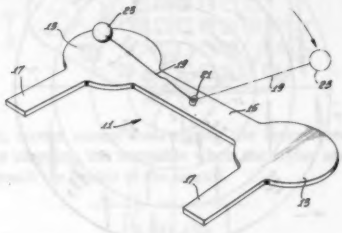


A manual dexterity game device in which randomly positioned target pieces are picked up by a pickup member slidingly suspended on a slack length of string connecting the end extremities of a pair of wands which are intricately, pivotably and rotatably mounted on a game board in position for controlled manipulation of the player. In a preferred embodiment, the player controls two interdependent pivotably rotating wands mounted one on the other with each hand and, by so doing, moves the game pickup member on the string into pickup contact with the randomly positioned game piece and locates it in a preselected target receptacle.

3,721,441
BALL BATTING PADDLE

Charles W. Wininger, 1691 N. Garden Drive, Apt. 13, San Bernardino, Calif.

Filed Aug. 2, 1971, Ser. No. 168,059
Int. Cl. A63b *67/10*
U.S. Cl. 273—97 **7 Claims**

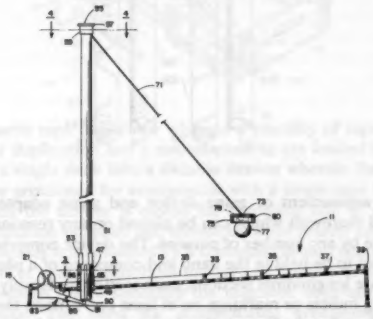


Apparatus including a ball attached by a cord midway between a pair of interconnected ball batting surfaces is disclosed. Handles are provided on the apparatus for maneuvering it so that the ball may be batted from one ball batting surface to the other.

3,721,442
TARGET AND MAGNETICALLY RELEASABLE PROJECTILE

Adolph E. Goldfarb, 4614 Monarca Drive, Tarzana, Calif. 91356, and George C. Strader, San Dimas, Calif.; said Strader assignor to said Goldfarb

Filed Feb. 24, 1971, Ser. No. 118,389
Int. Cl. A63b *71/02*
U.S. Cl. 273—101 **3 Claims**



A game comprising a playing board having receptacles thereon. A playing element is releasably magnetically held suspended above the board by a verticle rod and tether which allows the playing element to be freely swung over the playing surface. The vertical rod may be rapidly moved upwardly for selectively releasing the playing element as it swings over the board so as to drop it onto the playing surface in an attempt to place it in one of the receptacles.

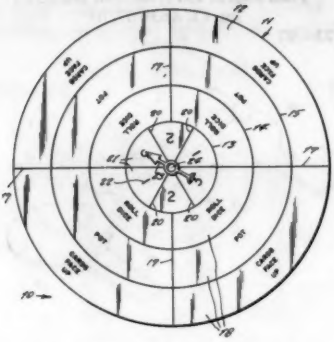
3,721,443
BOARD GAME APPARATUS

Ruby Napoli, 702 Hamilton Ave., Duquesne, Pa.

Filed July 15, 1971, Ser. No. 162,775
Int. Cl. A63f *3/00*
U.S. Cl. 273—135 AA **1 Claim**

An activity game for being played both by children and adults, the device consisting of a circular game board upon the

center of which there may be placed a spinner, the game board being divided into spaces each of which are identified by text, a pair of dice and four sets of numbered cards, each



set being of a different color. The cards are of a size to be placed on one of said board spaces, and the cards of each set are numbered from 2 through 12.

3,721,444

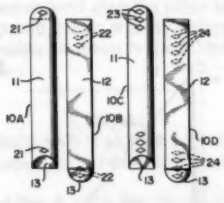
CHANCE SCORING APPARATUS AND METHOD OF USING SAME

Stavros Baltsas, 279 Fullerton Ave., and Peter C Patsalos, 69 Valley Ave., both of Newburgh, N.Y.

Filed May 25, 1970, Ser. No. 40,122

Int. Cl. A63f 9/04

U.S. Cl. 273—138 R **8 Claims**



An amusement or game device and game adapted to be played therewith which can be played on any reasonably flat surface by any number of persons. The device comprises a bar adapted to be held in the hand and composed of a plurality of separate longitudinal sections, each section preferably bearing scoring indicia or markings on at least one surface thereof. In a preferred embodiment, the device is a cylindrical bar composed of a pair of mated half-cylinders. In a preferred method of play, a pair of mated half-cylinders is held in one hand and preferably similar pair of mated half-cylinders is held in the other hand. The two cylinders are struck together and dropped on a flat surface and the score marks visible on such surfaces of the fallen half-cylinders as are in a pre-agreed scoring position are counted.

3,721,445

GAME OF CHANCE APPARATUS

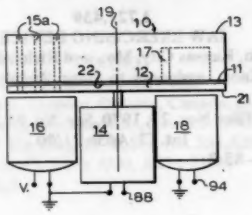
Joseph T. McNaney, 8548 Boulder Drive, La Mesa, Calif. 92041

Filed Mar. 8, 1972, Ser. No. 232,818

Int. Cl. A63f 5/04

U.S. Cl. 273—142 A **5 Claims**

The game of chance apparatus displays a player's score in the form of arrays of spots similar to the showing of the upturned face of a die. In the present invention an array of spots indicating a player's score is made visible by emissions of light therefrom and the number of spots in a given array will be a function of an angular relationship between a pair of light masks. Associated therewith



is an array of light responsive elements which detect and transmit a score to a data handling unit wherein a display of spots is compared with a player's predicted display and whether or not such prediction has materialized.

3,721,446

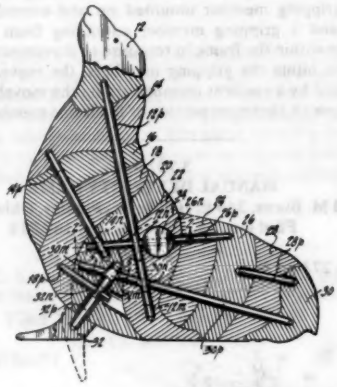
INTERLOCKING PUZZLE

Charles J. Young, 78 Stockton St., Princeton, N.J. 08540

Filed Mar. 24, 1971, Ser. No. 127,554

Int. Cl. A63f 9/12

U.S. Cl. 273—157 R **3 Claims**



A puzzle formed of a plurality of interfitting pieces which are interlocked with pins. The pins are attached to corresponding puzzle pieces. Each of the pins have portions formed with a notch. The pins extend through holes in one or more of the adjacent interfitting pieces and locking means, such as other pins extend through the notches to lock together the pins and the pieces to which they are attached. The puzzle can be unlocked by the removal of the pieces in a definite sequence.

3,721,447

GOLF PRACTICE DEVICE

Charles R. Louderback, 8112 W. Morgan Avenue, Milwaukee, Wis.

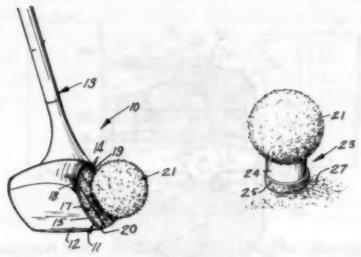
Filed April 12, 1971, Ser. No. 133,290

Int. Cl. A63b 69/36, 57/00

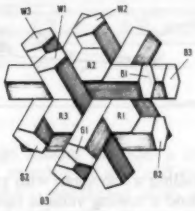
U.S. Cl. 273—186 E **1 Claim**

A device for practicing golf, including a contact engaging textile material surfaced pad adhered to the face of the head of a golf club, the strip or pad being marked with red lines so that the user can tell whether he hit the ball correctly. The

device also includes a contact engaging textile material covered ball which will cling to the adhesive pad on the head of the golf club when contact is made with the covered ball. Also included is a tee formed from a strip having a contact engaging textile material on one surface thereof. When the strip is formed into a cylinder and a longitudinal edge of the strip is folded back up itself, the contact engaging textile material defines an end of a cylindrical tee and the tee is adapted to grip the ball or cling to a rug or carpet.



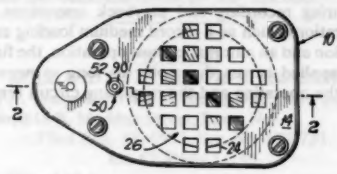
3,721,448
ASSEMBLY PUZZLE
Stewart T. Coffin, Old Sudbury Road, R.F.D. 1, Lincoln, Mass.
Filed May 4, 1970, Ser. No. 34,103
Int. Cl. A63f 9/12
U.S. Cl. 273—160 **19 Claims**



A symmetrical assembly puzzle including a total of 12 elongate pieces having notches formed therein to receive other pieces of the puzzle. Nine of the pieces have two notches and the remaining three pieces have an extra, third notch. The pieces may be arranged in three solutions. In each solution, the assembled puzzle includes four groups of pieces, each group including three of the pieces. The pieces in any assembled group are oriented in parallel to each other but at an angle to the pieces in each of the other assembled groups.

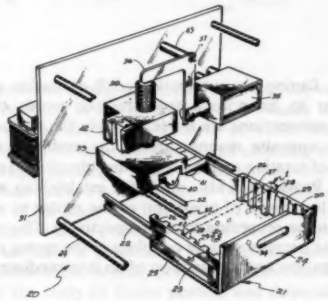
3,721,449
SOUND REPRODUCING DEVICE
Richard Sirinek, Cambria Heights, N.Y., assignor to Brumberger Co., Inc., New York, N.Y.
Filed April 28, 1970, Ser. No. 32,575
Int. Cl. G11b 25/04; A63l 3/28
U.S. Cl. 274—1 A **8 Claims**

A turntable mounted for rotation about a perpendicular axis and for reciprocation along the axis and carrying a record, a pickup arm pivotally mounted for movement parallel the record surface having a stylus engaging the record; a sound reproducing speaker engaged with the pickup opposite the record; biasing means for urging the stylus towards the rim of the record; a spring for urging the record towards the pickup arm; manually operably means for moving the record against the spring means to release the stylus from engagement



therewith; motor means for rotating the record and switch means for stopping the turntable when the stylus and pickup arm approach the center of the record.

3,721,450
MULTIPLE CASSETTE TAPE DUPLICATOR WITH SINGLE TAPE TRANSPORT
Joseph C. Medeiros, Chicago, Ill., assignor to Gardberg-Medeiros Co., d/b/a Magnetics Research Co., Chicago, Ill.
Filed April 10, 1970, Ser. No. 27,227
Int. Cl. G11b 5/86
U.S. Cl. 274—3 **6 Claims**

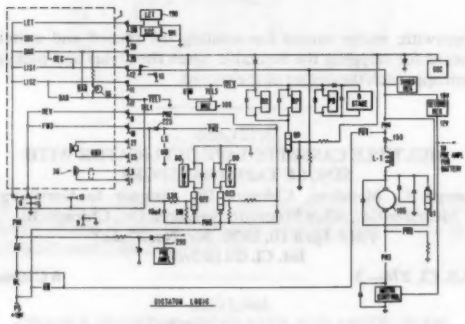


A cassette tape duplicator wherein a plurality of tape cassettes for duplication and a master cassette are loaded in the form of a single deck into a slidable drawer wherein the cassettes are positioned for engagement with a single tape transport when the drawer is closed for recording and in which synchronization of speed and torque between master cassette and duplicates is maintained by a common capstan shaft. Any variations of speed affect both master and duplicates so that the recordings follow faithfully the magnetic impressions of the master. The need for sophisticated synchronization techniques to abate distortion between tapes are thus effectively reduced resulting in a less expensive device.

3,721,451
RECORD MEDIUM DRIVING ARRANGEMENTS FOR SOUND TRANSDUCING APPARATUS
Chester M. Fackler, Austin, Tex., and David H. Lenderking, Raleigh, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.
Division of Ser. No. 767,760, Oct. 15, 1968, Pat. No. 3,599,065. This application Dec. 23, 1970, Ser. No. 100,999
Int. Cl. G11b 5/00
U.S. Cl. 274—4 J **7 Claims**

The invention concerns record medium driving arrangements for sound transducing apparatus, particularly set in a dictating and transcribing environment, and including mode control means for establishing a high-speed unregulated drive of the medium or regulated drive of the medium, as required during various operations. The apparatus incorporates a driv-

ing motor and circuits that insure a fast start-up time for the motor whether the conventional AC power source or battery is used. During start-up time, the full potential is applied across the motor and at a predetermined speed, the regulating circuit becomes effective to maintain the speed. This action applies during recording and playback operations. During other operations, such as a record medium loading and phasing operation and an automatic erase operation, the full power supply is applied across the motor as long as necessary to complete the operation and the regulating circuit remains in-



effective. During an automatic recall operation enabling a transcriber to listen to a few previous words of dictated material, connections are made to apply the available potential in an opposite manner across the motor to reverse its direction of rotation and the regulating circuit also remains ineffective. Provision is also made for establishing a relatively high and low speed of operation of the motor to achieve 10 and 20 minute recording times, respectively. The rapid starting-up time permits a direct coupling of the motor to the driving mechanisms and elimination of an intermediate clutch assembly.

3,721,452

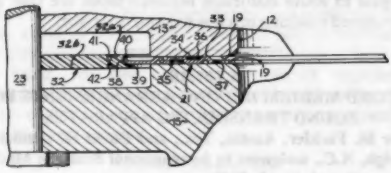
GASKET ASSEMBLY FOR PIPE FLANGES

Bobby E. Black, Chatsworth, Calif., assignor to PSI Products, Inc., Burbank, Calif.

Filed Feb. 22, 1971, Ser. No. 117,376

Int. Cl. F16j *9/04*; F16l *55/00, 21/02*

U.S. Cl. 277—9 **8 Claims**



This invention is a gasket assembly for positioning and sealing between pipe flanges and includes an annular seal portion together with a positioning member affixed to the periphery of the sealing portion. The positioning member includes a plurality of concentric separable annuli, the outer periphery of each annulus being adapted to mate with and be positioned by a bolt circle of a different diameter appropriate to pressure at which the gasket assembly and flanges are to be employed.

3,721,453

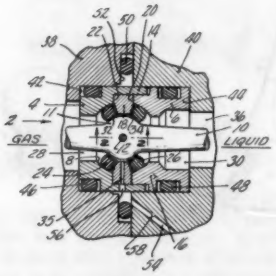
SEAL CONSTRUCTION

Paul F. Likavec, Detroit, Mich., assignor to Chandler Evans Inc., West Hartford, Conn.

Filed Feb. 1, 1971, Ser. No. 111,458

Int. Cl. F16j *15/38*

U.S. Cl. 277—30 **7 Claims**



A seal construction for a pivotally mounted lever includes a housing which surrounds a rounded intermediate portion of the lever. A pair of spaced seals are interposed between the housing and the rounded portion.

3,721,454

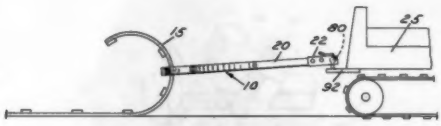
TOBOGGAN TOW-BAR

Charles E. Anderson, 31355 Rosenbusch Dr., Warren, Mich.

Filed Feb. 11, 1971, Ser. No. 114,609

Int. Cl. B62b *13/00*

U.S. Cl. 280—24 **7 Claims**



A tow-bar for trailing a toboggan with pulling and braking characteristics behind a towing vehicle having parallel cross-members which engage the toboggan in confined condition at the back and front surfaces of the front curved portion of the toboggan and side members which engage the side edges of the front curved portion of the toboggan. The arrangement prevents sidewise pivotal movement while allowing up and down pivotal movement therebetween. A tongue extends from the cross and/or side members for mounting a hitch thereon for connection to a towing vehicle. While the tow-bar allows up and down hinging movement it constitutes an axial extension of the toboggan devoid of conventional mechanical attaching means and devoid of lateral pivotal movement at the toboggan which substantially reduces fish-tailing and eliminates jack-knifing between the tow-bar and the toboggan and reduces jack-knifing between the toboggan and the towing vehicle.

3,721,455

WHEEL STABILIZER

Grover Blanton, Deming, N. Mex., assignor to Steer Safe, Inc., Deming, N. Mex.

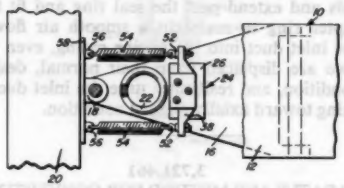
Filed Feb. 24, 1971, Ser. No. 118,338

Int. Cl. B60g *3/00*

U.S. Cl. 280—94 **10 Claims**

A spring structure for connection between the oscillatable wheel support of a vehicle and a vehicle chassis relative to which the wheel support is oscillatable about an upstanding

axis. The spring structure is operable to yieldingly resist angular displacement of the wheel support structure from a first predetermined position in either direction and includes structure operable to yieldingly resist angular displacement of the



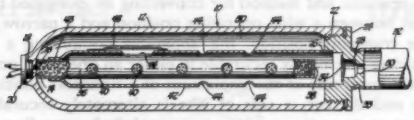
wheel support from the first position in either direction with a force gradually increasing at a first rate of increase as the support is displaced from the first position to a second position and thereafter at a second lower rate of increase as the wheel support is displaced passed the second position.

3,721,456

MULTIPLE STAGE INFLATER

Patrick G. McDonald, Pontiac, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 23, 1971, Ser. No. 136,869
Int. Cl. B60r *21/00*
U.S. Cl. 280—150 AB **4 Claims**



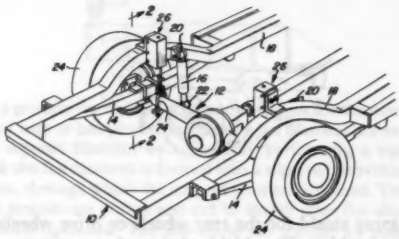
A multiple stage inflater includes a cylindrical pressure vessel having an opening at one end receiving an igniter assembly electrically connected with an inertial switch or other type of indicating means providing a signal indicative of deformation or the onset of deformation of a vehicle body. The other end of the vessel includes an outlet sealed by a fluid pressure rupturable diaphragm. The outlet communicates by a manifold and diffuser assembly with a conventional inflatable occupant restraint cushion. A propellant tube extends partially through the vessel from the igniter assembly and is filled with suitable pyrotechnic material, such as black powder. The tube includes a number of circular openings in the wall thereof. A primary inflation tube surrounds the propellant tube and defines a first chamber communicating with the diaphragm. The primary inflation tube is provided with a number of circular openings and a reed valve which permits flow from the first chamber to a second chamber defined by the primary inflation tube and the interior wall of the vessel. The second chamber and the space within the first chamber between the propellant and primary inflation tubes is filled with air at a pressure less than that required to rupture the diaphragm. Upon ignition of the pyrotechnic material, the resultant fluid or gas flows from the propellant tube to the first chamber to rupture the diaphragm and initiate inflation of the cushion. The resultant fluid also flows outwardly through the primary inflation tube openings and reed valve to the second chamber to mix with the air therein and provide increased pressure fluid. The increased pressure fluid then flows at a lesser rate back through the openings in the primary inflation tube and to the cushion to continue inflation thereof. The reed valve permits one-way flow only so that the increased pressure fluid flows at a lesser rate than the resultant fluid to the cushion.

3,721,457

ROLL AND SWAY CONTROL ASSEMBLY

Richard A. Tracy, 2455 4th Street, Sparks, Nev., and Julian C. Garate, 815 N. Maddux Street, Reno, Nev.

Filed Aug. 18, 1971, Ser. No. 172,731
Int. Cl. B60g *11/36*
U.S. Cl. 280—112 A **9 Claims**



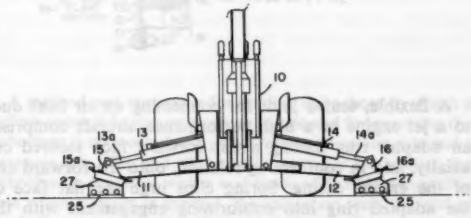
A compression spring controlled assembly for connection between the body or frame portion of a vehicle and an unsprung wheel of the vehicle relative to which the body or frame portion is vertically shiftable. The assembly is operative to increasingly yieldingly resist downward movement of the vehicle wheel relative to the frame or body portion or upward movement of the body or frame portion relative to the wheel past the relative static positions thereof. The spring controlled assembly includes a connection between the vehicle wheel and associated frame or body portion operative during upward motion of the body or frame portion and downward movement of the wheel relative to the associated frame or body portion past the relative static portions thereof. The spring controlled assembly does not in any way increase the load carrying capacity of the associated vehicle, but does function to decrease the adverse effects of a high center of gravity of laden weight and also functions to minimize the tendency of the frame and body portion of an unladen vehicle to roll while cornering.

3,721,458

STABILIZING SUPPORT FOR BACK HOE

Thomas Mitchell, 982 Connie Drive, Campbell, Calif.

Filed Nov. 27, 1970, Ser. No. 93,075
Int. Cl. B60s *9/02*
U.S. Cl. 280—150.5 **4 Claims**



Foot pads for the stabilizer arms of a back hoe provided with resilient pads of tough wear-resisting material engaging

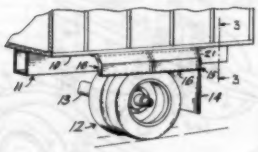
the asphalt or concrete surface of the pavement during use of the back hoe. The tough wear-resistant pads provide support for the stabilizer arms without digging into the pavement surface. The foot pads are pivotally attached to the ends of the stabilizer arms so that the tough resilient pad portions thereof adjust automatically to the contour of the pavement and provide firm footing for the stabilizer arms.

3,721,459

SPRAY SHIELD FOR HIGHWAY VEHICLE WHEELS

Harlan L. Lea, Wapakoneta, Ohio, assignor to Koneta Rubber Company, Inc., Wapakoneta, Ohio

Filed Mar. 4, 1971, Ser. No. 120,863
Int. Cl. B62d 25/16
U.S. Cl. 280—154.5 R **3 Claims**



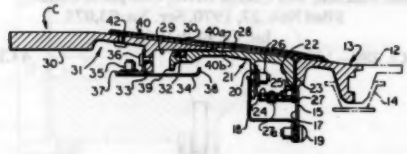
A spray shield for the rear wheels or drive wheels of a highway vehicle. The shield consists of one or more units. Each unit has a mounting flange, an outwardly and downwardly extending shoulder and a vertical skirt at the outer edge of the shoulder. Each unit has assembly means at each end. The shield is to be mounted on the vehicle chassis or underside of the body. The shield extends longitudinally of and overlies the upper outer side of the vehicle wheel, to intercept and divert spray thrown off of the top of the wheel or the vehicle body. Two or more units may be assembled in end-to-end relationship. An end plate is adapted to be mounted by the assembly means at an end of the shield. The splash shield is preferably constructed from a flexible or semi-flexible material such as rubber, flexible plastic, fabrics or fibre.

3,721,460

JET ENGINE TO AIR INLET DUCT FLEXIBLE JOINT AIRCRAFT

Leonard Holman, Imperial Beach, and Richard H. Timms, San Diego, Calif., assignors to Rohr Corporation, Chula Vista, Calif.

Filed Dec. 17, 1970, Ser. No. 99,062
Int. Cl. F16l 55/00
U.S. Cl. 285—175 **6 Claims**



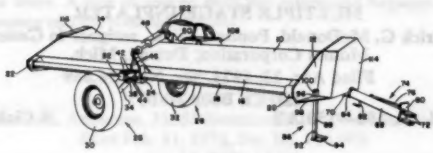
A flexible, sealed joint for connecting an air inlet duct to a jet engine of a high performance aircraft comprises an adapter ring having a flat forward face secured coaxially, and in conforming relation, onto the forward end of the engine casing. Spring clips urge the flat face of the adapted ring into conforming engagement with the flat rear face of a seal ring mounted in sealed relation, and for limited adjustment, on the aft end of the engine air inlet duct. An external flange near the aft end of the air inlet duct limits forward displacement of the seal rings, and thereby the engine, in the event of engine mount failure, while spring fingers limit axial separation of the seal ring and air inlet duct. A double thickness sleeve of flexible, springy, sheet metal is slitted transversely in its aft portion into relatively overlapping spring fingers, and is fitted into, and fastened at its forward end to the air inlet duct. The spring fingers are biased outwardly at their rear ends and extend past the seal ring and fit flush into the adapter ring to maintain a smooth air flow surface from the inlet duct into the engine casing, even when the latter two are displaced from their normal, designed coaxial condition, and resiliently urge the inlet duct and engine casing toward axially aligned condition.

3,721,461

APPARATUS AND METHOD FOR CONVERTING AN IMPLEMENT BETWEEN OPERATING AND TRANSPORT POSITIONS

Arlyn Ray Nelsen, and Gerald Franklyn Meiers, both of Ottumwa, Iowa, assignors to Deere & Company, Molin, Ill.

Filed Aug. 27, 1971, Ser. No. 175,517
Int. Cl. B60d 7/00
U.S. Cl. 280—415 R **6 Claims**



Apparatus and method for converting an elongated implement between a wide operating position and a narrow, endwise transport position, the apparatus comprising a hitch structure alternately securable in either an operating position on the front side of the implement or a transport position on one end thereof, a pair of wheels alternately securable in either an operating position on a rockshaft extending along the rear side of the implement or a transport position on a pair of front and rear wheel supports, an adjustable jack connected to the hitch structure, and a stand on one end of the implement, the stand being movable between raised and lowered positions. The method of converting the implement from its operating to its transport position comprises the steps of raising the implement by rotating the rockshaft, securing the stand in its lowered position, lowering the implement until the wheel nearest the stand clears the ground, removing that wheel from the rockshaft and securing it to the rear wheel support, lowering the implement further until the other wheel clears the ground, removing the other wheel from the rockshaft and securing it to the support on the front side of the implement, and finally, removing the hitch from the front side of the implement and securing it to one end thereof.

ERRATUM

For Class 285—175 see:
Patent No. 3,721,460

3,721,462

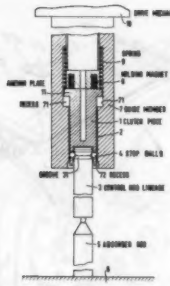
RAPID DISCONNECTION CLUTCH FOR NUCLEAR REACTOR CONTROL RODS

Rainer Pawlitzki, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Berlin, Germany

Filed June 9, 1970, Ser. No. 44,721
Claims priority, application Germany, June 19, 1969, P 19 31 108.1
Int. Cl. F16b 7/00
U.S. Cl. 287—119 **1 Claim**

Stop balls removably couple a control rod linkage to a clutch piece. The clutch piece is movably mounted in a guide

member. The guide member includes releasing means for releasing the stop balls and thereby decoupling the control rod



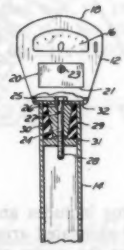
linkage from the clutch piece when the clutch piece moves to a determined position.

3,721,463

POST ADAPTER

Warren R. Attwood, Wayne; Herbert J. Henry, Plymouth, and Hugo E. Rebentisch, Jr., Garden City, all of Mich., assignors to Unistrut Corporation, Wayne, Mich.

Filed Nov. 23, 1970, Ser. No. 91,948
Int. Cl. F16b *9/00*
U.S. Cl. 287—20.3 **11 Claims**



An adapter for releasably securing an assembly, such as a parking meter, to the top of a hollow post and including a resilient member having a tapered bore formed therein. The resilient member is inserted over a complementary tapered base member extending from the lower surface of the assembly. A nut is threaded onto the lower end of a bolt which extends through the base member for retaining the resilient member thereon. The periphery of the nut is shaped so as to non-rotatably engage with the inner surface of the hollow post upon which the assembly is to be mounted. The nut, the resilient member, the tapered member, and the bolt extending from the lower surface of the assembly are inserted into the post and the bolt rotated so as to screw the nut onto the bolt, compressing the resilient member to wedge it onto the tapered base member, causing the resilient member to expand between the base member and the inner surface of the post so as to fixedly secure the assembly onto the post. The base member and the bore in the resilient member are frusto-conical in one modification and substantially pyramidal in another.

3,721,464

CONTINUOUS FRINGE FOR MAKING HAIRPIECES OR THE LIKE

Michel d'Atabekian, 28, rue des Tanneries, Paris, France

Filed May 10, 1971, Ser. No. 141,590
Claims priority, application France, May 21, 1971, 7018483
Int. Cl. B65h *69/04*
U.S. Cl. 289—1.5 **3 Claims**

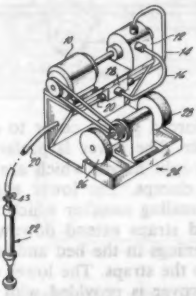
In a process for making continuous fringes for the manufacture of wigs or hairpieces, lengths of a fed filament are secured to a support filament by repeatedly performing a cycle in which the fed filament is formed into a slip knot providing two eyelets, through which the support filament is passed. The filament strands are pulled and cut to length after the slip knot has been tightened. The slip knots are formed by passing a length of the fed filament over two spaced apart fingers which are rotated in their center plane to form loops around the fingers, the fingers then being brought together to form two adjacent eyelets of the slip knot.

3,721,465

METHOD AND APPARATUS FOR HOLDING GEMS

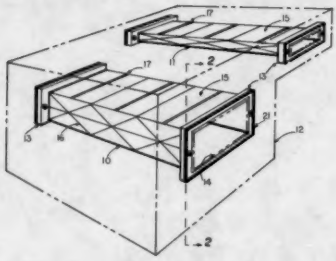
Frederick Kraissl, Jr., 244 Kinderkamack Rd., North Hackensack, N.J.

Filed Feb. 4, 1971, Ser. No. 112,535
Int. Cl. B66c *1/02*
U.S. Cl. 294—64 R **7 Claims**



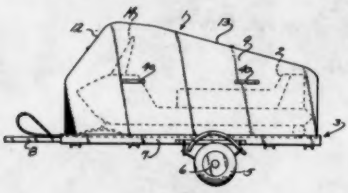
A method and apparatus for holding cabochons in which a hollow conduit having an opening at one end for receiving the cabochon is connected to a pump having a vacuum side and a pressure side. The end of the hollow conduit for holding the cabochon is provided with a seal made of flexible material so that when vacuum is applied, the cabochon seals the end of the hollow conduit so that the vacuum force will securely hold the cabochon in place. In this manner, such work as polishing and grinding may be carried out on the cabochon. On release of the vacuum, the cabochon is easily removed.

3,721,466
VEHICLE WIND TUNNEL
Arthur B. Abrams, 5221 Sierra Villa Drive, Los Angeles, Calif.
Filed Jan. 27, 1971, Ser. No. 110,158
Int. Cl. B62d 37/02
U.S. Cl. 296—1 S 1 Claim



A rectangular or square shaped duct or wind tunnel to be attached within interior of a vehicle, connecting opposing window or vent areas to provide a guided free flow of air to pass completely through vehicle without damage to interior or entrapment of foreign matter, within the vehicle.

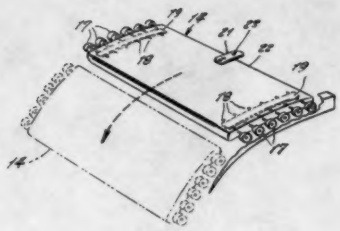
3,721,467
MOLDED PLASTIC COVER TO ENCLOSE A SNOWMOBILE ON A TRAILER
Donald D. Kerr, Box 338, Hartland, Wis.
Filed Feb. 3, 1971, Ser. No. 112,255
Int. Cl. B60p 7/02
U.S. Cl. 296—28 M 9 Claims



A molded reinforced plastic cover to enclose a snowmobile on a trailer. The cover is preferably formed of two longitudinally-split halves which are joined together by spring loaded clamps. The lower edge of the cover carries a resilient sealing member which rests on the bed of the trailer, and straps extend downwardly from the cover through openings in the bed and locking members can be attached to the straps. The lower edge of the forward end of the cover is provided with slots to receive the projecting ends of the skis of the snowmobile. The cover serves to protect the snowmobile from the elements, as well as preventing theft of the snowmobile.

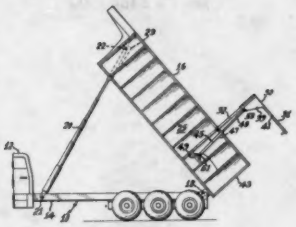
3,721,468
AUTO PADDED WINDSHIELD
Stanley E. Burgess, P.O. Box 220, Route 16, Somersworth, N.H.
Filed June 22, 1971, Ser. No. 155,439
Int. Cl. B60r 21/08
U.S. Cl. 296—84 K 1 Claim

A device to protect automobile passengers from impact against the glass windshield in case of a collision, the device consisting of a foam filled pad which in an inoperative position rest adjacent the underside of the vehicle roof, and which in case of a collision due to momentum force instantly slides



down adjacent the interior side of the windshield so to provide a soft and harmless cushion against which the passengers are thrown.

3,721,469
TAIL GATE APPARATUS
Real G. Senesac, 961 Carlotta Road W. 32211, and Guy M. Senesac, 2235 St. John's Bluff Road S. 32216, both of Jacksonville, Fla.
Filed Jan. 11, 1971, Ser. No. 105,288
Int. Cl. B61d 9/00
U.S. Cl. 298—23 MD 8 Claims

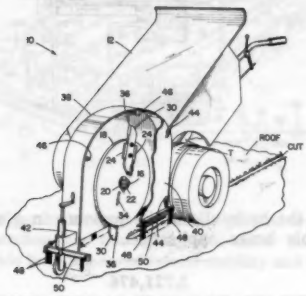


A tail gate aparatus includes an upstanding rear wall and a pair of spaced elongated arms rigidly connected to the rear wall adjacent the upper edge thereof and pivotally connected to respective side walls adjacent the upper edges thereof and forwardly remote from the rear body opening. The arms are disposed along and outwardly of the side wall upper edges for rigidifying same and guide members are connected to the rear wall adjacent the lower edge which cooperate with the side walls. Power means are attached to the tail gate apparatus for opening and closing the rear body opening and when open the rear wall is generally parallel to and above the body bottom wall and spaced upwardly a substantial distance above the side wall upper edges to provide a dumping opening of substantially twice the area of the rear wall.

3,721,470
ROTARY CUTTER APPARATUS FOR ROOFING MATERIAL
Daniel P. Crispino, 451 Fawcett Street, Baltimore, Md.
Filed Feb. 2, 1971, Ser. No. 111,941
Int. Cl. E04d 15/00
U.S. Cl. 299—39 1 Claim

A power driven rotary cutter apparatus is provided for cutting of lines in old roofing material in preparation for

removing of the old roofing material and replacing it with new roofing material. The apparatus consists of a motor driven tractor having a drive member positioned substantially transversely to the direction of movement of the tractor. A heavy



flywheel type wheel is positioned on the drive member, and spaced blade members are positioned around the periphery of the wheel for use in cutting of roofing material. A device is provided for adjusting the height of the blade members from a roofing surface that is to be cut by the blade members.

3,721,471

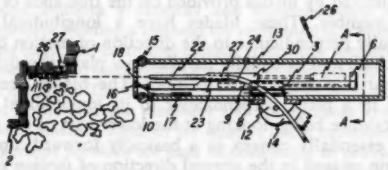
DRILL-AND-BLAST MODULE

Oswald R. Bergmann, Cherry Hill Township, N.J., and David L. Coursen, Newark, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 878,005, Nov. 19, 1969. This application Oct. 28, 1971, Ser. No. 193,323

Int. Cl. E21c *37/00*

U.S. Cl. 299—55 **9 Claims**



Working, e.g., excavating, a geological mass by a succession of substantially continuous drill-load-blast sequences, each sequence comprising drilling a hole in the mass, placing a charge of condensed secondary explosive in the hole, and initiating the charge by projecting propagative energy, e.g., the kinetic energy of a high-velocity projectile, through an inactive medium, e.g., the atmosphere, to the charge from a location which confronts, and is separated from, the hole in a manner such that energy is released into the charge at a rate sufficiently high to cause detonation thereof. An apparatus including drilling means, explosives-delivery means, and means for projecting energy, e.g., a gun, mounted on support means that preferably can be moved so as to position the drilling means, explosives delivery means, and energy-projection path sequentially on substantially a common axis.

3,721,472

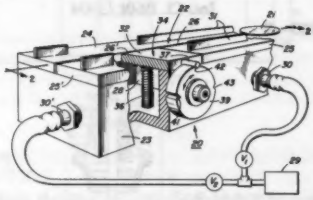
COANDA EFFECT SWITCH FOR HANDLING AND CONVEYING WORKPIECES ON A LAYER OF FLUID

Walter Kester Mammel, Yardley, Pa., assignor to Western Electric Company, Incorporated, New York, N.Y.

Continuation-in-part of application Ser. No. 607,793, Jan. 6, 1967. This application Jan. 3, 1969, Ser. No. 801,903

Int. Cl. B65g *53/04*

U.S. Cl. 302—31 **20 Claims**



A method and device utilizes the Coanda effect of a fluid flowing use of an aperture and over an adjacent step to manipulate a workpiece, such as a slice of semiconductor material, relative to an aerodynamic conveyor or a pickup head.

3,721,473

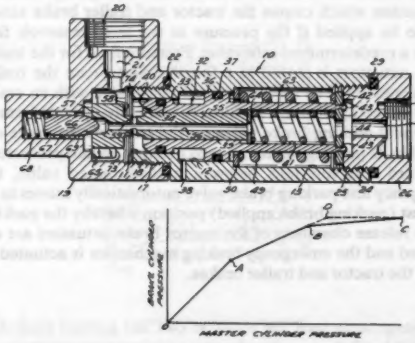
THREE SLOPE PROPORTIONING VALVE

Tadeusz Budzich, Moreland Hills, Ohio, assignor to The Weatherhead Company, Cleveland, Ohio

Filed Dec. 20, 1971, Ser. No. 209,761

Int. Cl. B60t *11/34*

U.S. Cl. 303—6 C **7 Claims**



A three slope proportioning valve for a motor vehicle hydraulic brake system is disclosed. The valve is normally open to permit free fluid flow from the inlet port to the outlet port below a first predetermined inlet port pressure. At the first predetermined pressure, a differential area piston is displaced and engages a floating valve member to isolate the inlet port from the outlet port. The differential area piston and the valve member then move together to decrease the outlet port volume and maintain increases in outlet port pressure above the predetermined pressure in a first predetermined proportional relation to increases in inlet port pressure up to a second predetermined inlet port pressure level. At the second predetermined pressure, the floating valve member is stopped against further movement, and the differential area piston

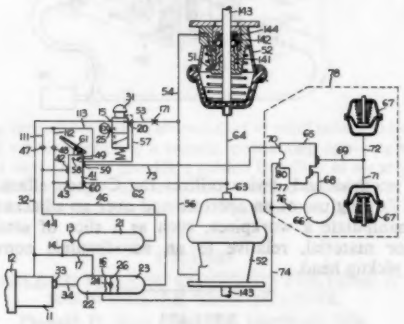
moves away from the valve member to establish throttled fluid pressure communication between the inlet port and the outlet port to maintain further increases in outlet port pressure in a second predetermined proportional relation to further increases in inlet port pressure.

3,721,474

VEHICLE BRAKE CONTROL SYSTEM WITH SAFETY PARKING FEATURE

George W. Rogers, Petersburg, Ill., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed March 27, 1972, Ser. No. 238,390
Int. Cl. B60t *13/04*
U.S. Cl. 303—9 13 Claims



An air compressor and three reservoirs are mounted on the tractor unit, one of which supplies pressure fluid to the tractor brakes, a second of which supplies pressure fluid to control the trailer brake actuators and a third of which supplies pressure fluid to the parking brake release chamber of the tractor brake actuators and to control an emergency braking mechanism which causes the tractor and trailer brake actuators to be applied if the pressure in the third reservoir falls below a predetermined safe value. Pressure fluid for the trailer brake actuators is stored in a fourth reservoir on the trailer and is controlled by a conventional relay valve with an emergency brake application feature. A manually operated emergency and parking brake valve on the tractor is pressure detented in its parking brake released position. When pressure in the third reservoir falls below a predetermined value, the emergency and parking brake valve automatically moves to its exhaust (parking brake applied) position whereby the parking brake release chambers of the tractor brake actuators are exhausted and the emergency braking mechanism is actuated to apply the tractor and trailer brakes.

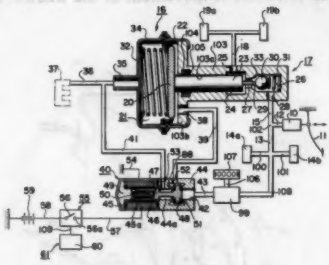
3,721,475

METHOD AND APPARATUS FOR THE CONTROL OF ANTISKID BRAKE SYSTEM FOR POWERED VEHICLES

Toshiharu Kawase, Toyota-shi, and Yukio Awakura, Aichi-ken, Japan, assignors to Aisin Seiki Company Limited, Toyota-shi, Japan

Filed Oct. 9, 1969, Ser. No. 865,091
Int. Cl. B60t *8/12*
U.S. Cl. 303—21 F 8 Claims

In a method and apparatus for antiskid control of a hydraulic brake system for powered vehicle wheels, the improvement comprises a sensor which senses occasional value of coefficient of adhesion appearing between said wheels and a road surface on which the wheels travel, said memoried value being taking into account for the modification of the hydraulic brake pressure in a sudden and considerable brake application.



3,721,476

TRACK CHAIN FOR TRACKED VEHICLES

Björn Axel Henning Andersson, Gullanget, Sweden, assignor to AB Haggelund & Soner, Ornskoldsvik, Sweden

Filed Mar. 3, 1971, Ser. No. 120,430
Claims priority, application Sweden, Mar. 31, 1970, 4,389/70
Int. Cl. B62d *55/20*
U.S. Cl. 305—35 R 5 Claims

The present invention relates to a track chain for tracked vehicles, said chain consisting of track members that are hinged to each other. The object of the invention is to improve the transmission of motive power from the vehicle to the surface travelled on, especially loose surfaces such as snow, or in water. The invention is mainly characterized by blades provided on the free ends of each track member. These blades have a longitudinal axis essentially perpendicular to the direction of motion of the track chain and essentially parallel to a plane through the joint parts of each track member. The blades are also curved in a plane perpendicular to its longitudinal axis, the curvature being, looking at the lower part of the track chain, essentially convex in a basically forward, upward direction as seen in the normal direction of motion of the tracked vehicle, and concave in a basically rearward, downward direction. A tangent plane to the blade's curved surface, near the blade's forward edge, forms an angle α greater than 90° with the normal direction of motion of the tracked vehicle.

3,721,477

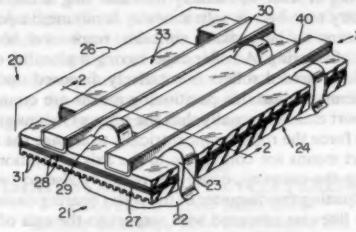
ENDLESS TRACK

Jerry W. Cooper; Leland E. Williams, both of Waynesville; John S. Haley, Lake Junaluska, and Rufus N. Easley, Clyde, all of N.C., assignors to Dayco Corporation, Dayton, Ohio

Filed Aug. 20, 1970, Ser. No. 65,568
Int. Cl. B62d *55/24*
U.S. Cl. 305—38 18 Claims

An endless track is provided that is comprised of band-like body made of an elastomeric material and a plurality of cleats

securely bonded thereto by partial embedment therein, and the body has a suitable drive mean enabling the track to be driven by an associated drive. Each cleat has a substantially U-



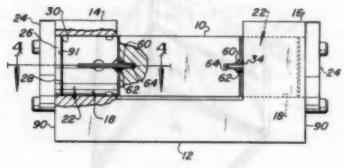
shaped configuration comprised of a bight and a pair of outwardly extending legs having exposed outer ends and the cleats provide both improved lateral stability and traction for the track.

3,721,478

LINEAR ANTIFRICTION BEARING

Theodore D. Anderson, Fruitport, and William J. Harms, Nunica, both of Mich., assignors to Gardner-Denver Company, Quincy, Ill.

Filed Jan. 25, 1971, Ser. No. 109,280
Int. Cl. F16c *29/06*
U.S. Cl. 308—6 C **7 Claims**



A linear antifriction bearing arrangement including two relatively movable machine members and a plurality of cylindrical bearing cartridges mounted for providing linear movement of one member with respect to another. Each bearing cartridge includes a raceway and interconnected internal passageways forming a channel for recirculating a plurality of bearing balls. The cartridges include removable retainer plates for retaining and guiding the bearing balls through the recirculation channels. The bearing cartridges are slidably journaled in one of the machine members and are operable to support the other machine member for relative linear movement. The arrangement provides for ease of preloading to provide zero lateral play and the individual cartridges are self-aligning to provide even load distribution.

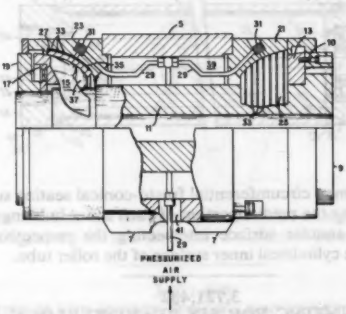
3,721,479

GAS BEARING AND METHOD OF MAKING SAME

William H. Rasnick, Concord, and Philip J. Steger, Oak Ridge, both of Tenn., assignors to The United States of America as represented by the United States Atomic Energy Commission

Filed May 19, 1971, Ser. No. 144,953
Int. Cl. F16c *17/16*
U.S. Cl. 308—9 **4 Claims**

An improved externally pressurized gas bearing and method of making same have been provided wherein the porous bearing surface is modified by a surface treatment which yields a boundary layer having selected permeability limits. The bearing materials are machined or formed by conventional means to the desired shape and size, then lapped to the desired surface finish and treated with an impregnant dissolved in a suitable solvent. The permeability of the bearing is then checked to determine areas of high permeability. The bearing surface is then selectively treated so as to provide uniform limited permeability at the surface of the bearing. This process provides restricted uniform gas flow to the bearing film at the



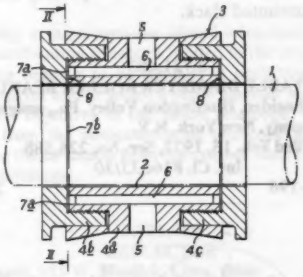
bearing surface thereby providing improved operational stability by greater damping of self-induced or externally-induced vibrations of a load member supported for movement with respect to the bearing surface, independent of the bearing loading.

3,721,480

GAS BEARING ASSEMBLY

William C. Dee, Wimborne, Dorset, England, assignor to Aerostatic Limited, Poole, England

Continuation-in-part of Ser. No. 557,231, June 13, 1966, Pat. No. 3,510,175. This application March 12, 1970, Ser. No. 26,463
Claims priority, application Great Britain, Oct. 15, 1968, 48,931/68
Int. Cl. F16c *17/16*
U.S. Cl. 308—9 **5 Claims**



A fluid bearing has two or more gas feed slots opening at one or more axial positions into a bearing gap defined between two relatively movable bearing members, the slots being defined between two contiguous elements of one of the bearing members.

3,721,481

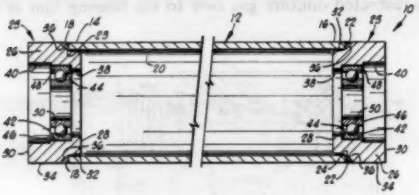
ROLLER DEVICE WITH IMPROVED HUB CONSTRUCTION

Louis A. Chenot, Oklahoma City, Okla., assignor to Fife Corporation, Oklahoma City, Okla.

Filed June 22, 1971, Ser. No. 155,444
Int. Cl. F16c *13/02*
U.S. Cl. 308—20 **20 Claims**

A welded roller comprising a cylindrical roller tube with a roller hub welded to each end face thereof. In one form, a cir-

cumferential concave seating surface formed about the medial portion of each roller hub intersects the respective end of the roller tube along the line of intersection of the respective end face and the cylindrical inner surface of the roller tube. In



another form, a circumferential frusto-conical seating surface formed about the medial portion of each roller hub engages a chamfered annular surface intersecting the respective end face and the cylindrical inner surface of the roller tube.

3,721,482

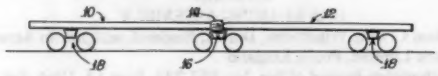
MOUNTING FOR PIN BEARING BLOCK

Carl E. Tack, Elmhurst, and Loyal J. Rodgers, Kenilworth, Ill., assignors to Amsted Industries Incorporated, Chicago, Ill.

Continuation-in-part of application Ser. No. 813,870, Apr. 7, 1969, now Patent No. 3,646,604. This application Nov. 11, 1971, Ser. No. 198,009

Int. Cl. F16c *23/04*

U.S. Cl. 308—72 **6 Claims**



An articulated connection is provided having a bearing block with spherical protrusions which are seated in spherical pockets of a male member. The spherical protrusion—spherical pocket arrangement allows the bearing block to be rotated relative to the male member during angulation. The rotation is accomplished without the addition of unwanted slack.

3,721,483

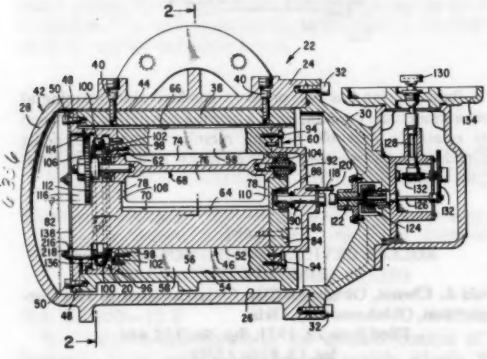
ADJUSTABLE DIAMETER ROLLER BEARING

George W. Schneider, Huntingdon Valley, Pa., assignor to The Singer Company, New York, N.Y.

Filed Feb. 15, 1972, Ser. No. 226,588

Int. Cl. F16c *33/30*

U.S. Cl. 308—196 **24 Claims**



An adjustable diameter roller bearing is mounted upon an internal stationary member having an axis of rotation. An external rotor is disposed to rotate about the axis of rotation. In order to reduce the cost of manufacturing the mating parts while holding to the required tolerances, the subject bearing has an adjustable diameter or is radially shiftable. A support means having at least one axially movable ring is carried on the stationary member. A split raceway is mounted upon the support means to be radially shiftable responsive to axial movement of the ring. A roller cage having a plurality of circumferentially spaced rollers is rotatively disposed upon the raceway means. Adjustable positioning means are connected to the support means to axially shift the support means and the raceway to force the rollers concentrically to engage the rotor. The support means are concentric to the axis of rotation, and by engaging the raceway, cause the raceway also to be concentric. Adjusting the diameter of the roller bearing causes the rotor to be likewise centered with respect to the axis of rotation. Wedge means in the form of annular chamfers or arcuate shoulders, are used to expand or contract the diameter of the raceway, while annular garter springs urge the raceway to contact the support means.

3,721,484

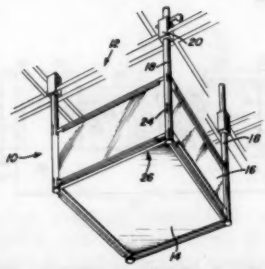
MODULAR SHOWCASE

Frank Anthony Macioge, and Henry Grant Ingersoll, both of Washington, D.C., assignors to Cantebury Tales, Inc., Washington, D.C.

Filed March 16, 1972, Ser. No. 235,352

Int. Cl. A47b *67/02*; A47f *5/08, 3/00*

U.S. Cl. 312—245 **7 Claims**



A suspended showcase is developed from modular components including telescoping pole supports that project from a fixed structure such as a ceiling. Frame members key into slots that are formed in the pole supports, and a base panel is lowered into the frame. Side glass panels slide into channels formed in the frame members thereby completing the suspended showcase.

3,721,485

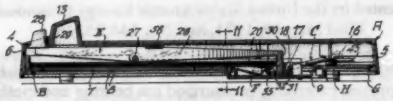
TELEPHONE INDEX DEVICE

Richard E. Beger, Point Pleasant, N.J., assignor to The Bates Manufacturing Company, Orange, N.J.

Filed Feb. 17, 1972, Ser. No. 227,564

Int. Cl. A47b *88/00*

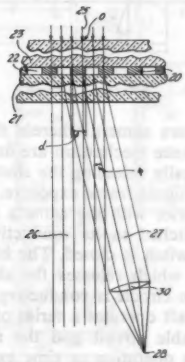
U.S. Cl. 312—330 **9 Claims**



An index device includes a housing and a drawer therein supporting a plurality of edge-notched and perforated cards and slidable into open and closed positions and

held in closed position by a latch rod pivoted in the housing and biased into coaction with a keeper on the drawer, a manually operated key lever for each card pivoted between its ends in the housing which at one end actuates a card puller on the drawer into position to engage the notched edge of an associated selected card and has a stud which at the same time enters the holes in all cards above the selected one to hold them against movement with the drawer and then directly actuates the latch rod to release the drawer for movement outwardly of the housing with the selected card exposed.

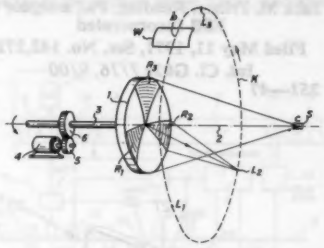
3,721,486
LIGHT SCANNING BY INTERFERENCE GRATING AND METHOD
Arthur Bramley, 7124 Strathmore St., Falls Church, Va. 22042
Filed Jan. 13, 1970, Ser. No. 2,486
Int. Cl. G02b *17/00*
U.S. Cl. 350—6 **15 Claims**



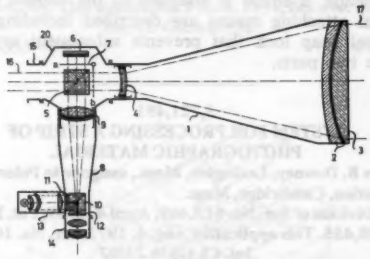
In producing a time sequential linear scan, light is passed through deflection gratings arranged adjoining one another in parallel planes, each of the gratings having its lines in ordered spacial relationship, preferably being divided into four equal sectors with the lines in each sector parallel. The gratings are moved oppositely while maintaining a position to intercept a light beam. The gratings preferably rotate oppositely on parallel axes. Light is passed through the gratings preferably normal to each of them and traces a linear scan on a viewing screen preferably placed parallel to the planes of the gratings. Mirrors between the gratings deflect the incident light to the second grating so that it is normal thereto on entering. In the preferred form the spacing between the gratings is approximately equal to the spacing between the viewing screen and the nearest grating. In the preferred embodiment each grating consists of two optical flats with grating elements located between them, the spacing of the optical flats being adjustable to change the phase.

3,721,487
OPTICAL DIFFRACTION GRATING SCANNING DEVICE
Guy Pieuchard, Fontenay Le Fleury; Jean Flamand, Chatenay Malabry, and Antoine Labeyrie, Gif Sur Yvette, all of France, assignors to JOBIN-YVON, ARCUEIL, Arcueil, France
Filed July 9, 1971, Ser. No. 161,038
Claims priority, application France, July 23, 1970, 7027185
Int. Cl. G02b *5/18*
U.S. Cl. 350—7 **4 Claims**

An optical scanning device comprises a source of monochromatic light and diffraction gratings on a spherical concave surface for producing a number of light-spots having a diameter of between 0.1 and 100 microns. The concave surface is rotated so that the light-spots describe a single circle intersecting, along the scanning line, a surface to be explored.



3,721,488
FOCUSING ARRANGMENT FOR AFOCAL TELESCOPES
Christoph Kuhne, Heidenheim, Germany, assignor to Carl Zeiss-Stiftung d/b/a Carl Zeiss, Heidenheim (Brenz) Wuerttember, Germany
Filed May 4, 1971, Ser. No. 140,183
Claims priority, application Germany, May 29, 1970, P 20 26 340.5
Int. Cl. G02b *7/04*
U.S. Cl. 350—46 **4 Claims**



A focusing arrangement for afocal telescopes in which a small autocollimating telescope limited to the cross-section of the entering beam is to be focused in itself toward a plane reference mirror and in which a plane glass-air surface is used to cover the objective of the afocal telescope, whereby the reflection from the autocollimating telescope is utilized for recognizing the deviation from the correct state of focusing of the afocal telescope.

3,721,489
REFLECTOR
Steve Horvath, 915 W. Bluelick, Lima, Ohio
Filed July 23, 1971, Ser. No. 165,675
Int. Cl. G02b *5/12*
U.S. Cl. 350—97 **5 Claims**

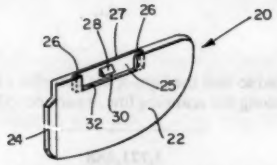
A reflector and/or tail light for mobile dwellings and the like having means therein for leveling a portable dwelling on uneven terrain.

3,721,490

REMOVABLE PROTECTIVE SIDE SHIELD ASSEMBLY FOR MOUNTING ON SPECTACLES

Jack M. Prince, Reading, Pa., assignor to ESB Incorporated

Filed May 11, 1971, Ser. No. 142,272
Int. Cl. G02c 7/16, 9/00
U.S. Cl. 351—47 3 Claims



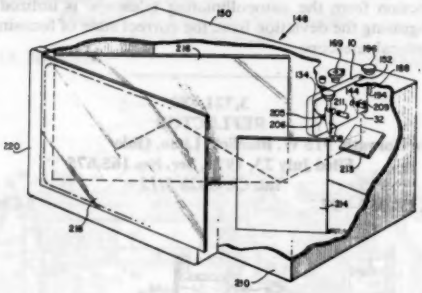
A removeable clear protective side shield for spectacles is described in which a single universal side shield type is combined with one of several shapes of support slideably mountable on the spectacle temple so as to give a customer choice in finding a shield suitable for mounting on his particular spectacle design. Once a choice of support has been made, a shield is attached to the chosen support. Several attaching means are described including a mechanical snap lock that prevents subsequent separation of the two parts.

3,721,491

SYSTEM FOR PROCESSING A STRIP OF PHOTOGRAPHIC MATERIAL

Rogers B. Downey, Lexington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 813,469, April 4, 1969, Pat. No. 3,608,455. This application Aug. 4, 1971, Ser. No. 169,007
Int. Cl. G03b 23/02
U.S. Cl. 352—72 4 Claims



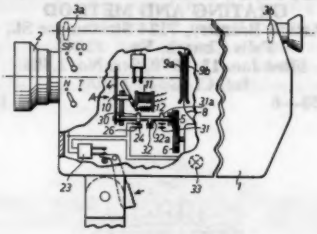
A motion picture system including a film handling cassette and a rear projection screen viewer. The cassette has a projection station which may include a light reflecting element and is insertable into an elongated slot in the top wall member of the viewer. Complementary features of the cassette and viewer permit the viewer to selectively restrain rotation of a film guide idler within the cassette during film projection operations.

3,721,492

ELECTROMAGNETIC SHUTTER RELEASE FOR CONTINUOUS OPERATION AND SINGLE-FRAME OPERATION IN MOTION PICTURE CAMERAS

Arthur Kessler, Koppern, Germany, assignor to Ernst Leitz GmbH, Wetzlar, Germany

Filed Mar. 1, 1972, Ser. No. 230,767
Claims priority, application Germany, Mar. 22, 1971, P 21 13 789.3
Int. Cl. G03b 21/32
U.S. Cl. 352—137 5 Claims



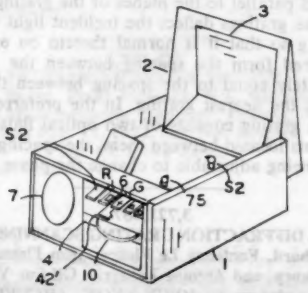
A motion picture camera wherein the rotating shutter and the film advance mechanism are driven by an electric motor for optionally releasing the shutter for continuous operation or for single frame exposure. A bi-stable circuit is provided in series with the camera release switch, the circuit being switched to its conductive state when the camera release switch is closed. The bistable circuit controls a solenoid which releases the shutter for rotation when the bistable circuit is conductive. A series of cams on the shutter shaft operates a series of switches for controlling the bistable circuit and the solenoid to secure either continuous operation or time exposures.

3,721,493

AUDIO VISUAL MEANS

Abraham Schneiderman, Westbury, N.J., and George G. Wechsler, North Bellmore, N.Y., assignors to Viewlex, Inc., Holbrook, N.Y.

Filed Sept. 10, 1971, Ser. No. 179,312
Int. Cl. G03b 31/06, 21/00
U.S. Cl. 353—19 4 Claims



In a machine of the type which projects pictures and synchronized audio information from an audio-visual cartridge of the type having a circular holder with a plurality of picture transparencies spaced along its periphery, said holder containing an audio record which is freely rotatable, and a

tone arm for said audio record, the improvement comprising new and improved rotatable drive means for said picture holders including roller clamping assembly means and operating lever means connected to said clamping means, pivotally mounted gear arm assembly means connected to index said picture holder, said operating lever being adapted to synchronize and control the operation of tone arm and the gear drive for the picture holder and having cartridge sensing means adapted to prevent the operation of the device unless a cartridge is properly inserted.

3,721,494

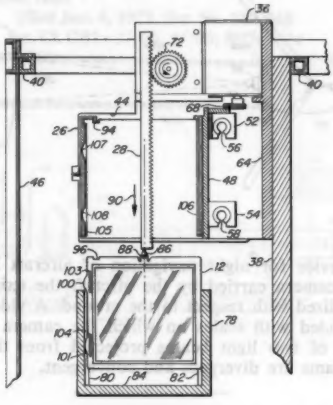
SLIDE CHANGER

Richard L. Stine, Cardiff-by-the-Sea, Calif., assignor to Stromberg DatagraphiX, Inc., San Diego, Calif.

Filed Jan. 15, 1971, Ser. No. 106,829

Int. Cl. G03b 23/00

U.S. Cl. 353—103 **8 Claims**



A slide changer especially adapted for handling forms slides in computer output microfilming equipment is disclosed. A magazine holds a plurality of slides in frictional engagement with substantially parallel grooves on inner magazine walls. An actuating bar adjacent to the magazine engages a selected slide to move the slide out of the magazine into a projection station. The actuating bar latches to the slide in a ball-and-socket manner as the slide is fully inserted into the projection station. After use, the bar moves the slide back into the magazine and automatically disengages from the slide. Each slide is provided with integral spring guide members formed in the slideframe along one edge, which comprise outwardly extending projections with slots parallel to the slide edge behind each projection. The magazine is movable in a direction perpendicular to the plane of the slides so that different slides may be selected.

3,721,495

CONTROL APPARATUS FOR FILM TRAVEL ACTUATED BY PICTURE FRAME EDGE SIGNALS

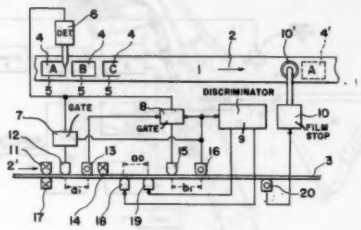
Atsuyuki Tanaka, Toyonakashi, Osaka-fu, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed June 9, 1970, Ser. No. 44,730

Int. Cl. G03b 27/46

U.S. Cl. 355—41 **9 Claims**

This invention relates to a control apparatus for film travel, actuated by picture frame edge signals, which apparatus controls the travel of a roll of film having no perforations, on which a number of picture images are successively disposed, in order to print in sequence each picture image on said film, which apparatus controls the travel of the film by operating a film stop device by means of signals from a detection device for detecting the rapid change of the density at the fore edge and the aft edge of the picture image frame, and which, when



its discriminator cannot detect the above signals or does not accept the signal detected as a correct picture frame edge signal, controls the travel of the film by means of another edge signal.

3,721,496

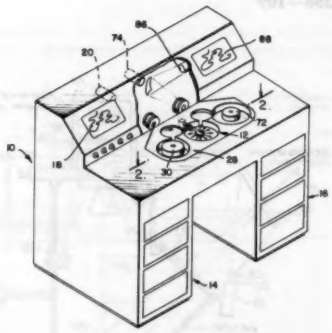
IMAGE EXPOSURE AND DEVELOPMENT METHOD

Alfred F. Kaspaul, Malibu, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Continuation-in-part of Ser. No. 115,943, Feb. 17, 1971, Pat. No. 3,664,249. This application Feb. 4, 1972, Ser. No. 223,533

Int. Cl. G03b 27/32

U.S. Cl. 355—77 **6 Claims**



The image exposure and development method of this invention comprises: the steps of exposure of a sensitive medium which is developable by the deposition of atoms thereon, feeding the exposed medium to wrap around a major portion of the circumference of spaced discs, and directing a vapor flux between the discs to impinge upon the medium so that the latent image thereon is developed by selective acquisition of the metal onto the surface.

3,721,497

RING LASER GYROSCOPE LINEARIZATION SYSTEM

Sidney G. Shutt, Brea; Thomas J. Hutchings, Orange, both of Calif., and James T. Hoffman, Kettering, Ohio, assignors to North American Rockwell Corporation, El Segundo, Calif.

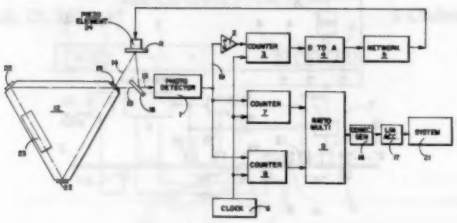
Filed April 19, 1971, Ser. No. 135,200

Int. Cl. G01b 9/02

U.S. Cl. 356—106 LR **6 Claims**

The invention is directed to a system which operates in combination with a ring laser type gyroscope having an output defined by the equation $\psi = \Omega\, 30\, \Omega_L \sin(\psi + \epsilon)$ such that the

system drives the term ϵ to zero. In the equation Ω is the input rotation rate of the ring laser gyroscope, Ω_L is the lock-in rate or that rate below which no output is obtained due to frequency entrainment of the two optical oscillators, ψ is the instantaneous phase difference between the two optical oscillators and ϵ is the phase angle at time, t, equal to zero. Additional electronic circuits then allow the complete term to be reduced to zero.

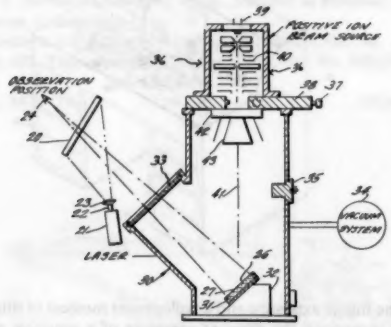


3,721,498

SYNTHESIZED HOLOGRAM FOR AN ARTIFICIAL OPTICAL TEMPLATE

Leo Narodny, Cold Spring Harbor, and Louis E. Sharpe, Malverne, both of N.Y., assignors to Kollsman Instrument Corporation, Syosset, N.Y.

Filed June 16, 1969, Ser. No. 833,334
Int. Cl. G01b 9/02; G02b
U.S. Cl. 356—109 **7 Claims**



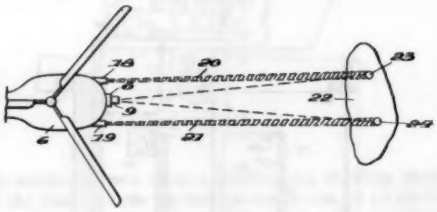
The interference patterns that would be recorded on a hologram from a complexly shaped surface such as the surface of an optical element or jet turbine blade, or the like, is calculated in a suitably programmed computer which may be coupled to an automatic plotter. The automatic plotter will then print the interference pattern which would be produced by projection of the pattern on the film in the form of dots of variable spacing or of different shading in order to produce the desired pattern. This printed pattern is then photographed with a high resolution film such as one capable of resolving four-hundred separate dots per millimeter of length, with this film serving as a hologram containing the synthesized interference pattern that represents the computed surface. The hologram or artificial optical template is then illuminated by a laser source so that a virtual image of the computed surface is produced. An object having a surface which is to be compared to the computed surface is then superimposed on the virtual image position so that an interference pattern is produced which describes the difference between the contour of the actual surface and the contour represented by the virtual image of the hologram template. The object may be a work piece which is to be surface eroded until it conforms to the desired pattern in which case the interference pattern is utilized to control the surface erosion operation.

3,721,499

NAVIGATING AND LANDING DEVICE FOR AIRCRAFT

Jean Raymond Narbaits-Jaureguy, 1 Rue Louis Mercier, Malakoff, France

Filed June 30, 1966, Ser. No. 562,947
Int. Cl. G01b 11/26; G01c 1/00
U.S. Cl. 356—152 **2 Claims**



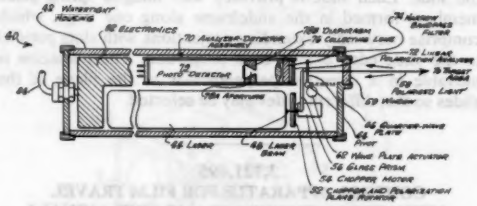
A device for night navigation of aircraft has a television camera carried by the aircraft the axis of which is stabilized with respect to the ground. A video monitor is provided with scales on which the camera shows the images of two light beams projected from the aircraft. The beams are divergent and convergent.

3,721,500

INSTRUMENT FOR MEASURING THE DEPOLARIZATION OF BACKSCATTERED LIGHT

Ronald Bruce Fugitt, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Filed Aug. 6, 1971, Ser. No. 169,715
Int. Cl. G01n 21/40
U.S. Cl. 356—118 **5 Claims**



An instrument capable of obtaining information on the polarization properties of ocean waters. Operation of the instrument is as follows: Light from a He-Ne laser passes through a rotating beam chopper, a rotating linear polarizer, and a light guide and an aperture (to block spurious reflections) into the scattering medium, generally seawater. A portion of the backscattered light is intercepted by an analyzer-detector module, and after amplification the detector output is displayed on an oscilloscope. The beam is chopped at 20

times the rotational frequency of the polarizer. This provides an a-c backscatter signal which is independent of detector drift and changes in background illumination, if detector saturation is avoided. The rotating polarizer produces a modulation of the signal at twice the rotational frequency. The maximum signal P_{max} occurs when the polarizer and analyzer are in the "aligned" position, and the minimum signal P_{min} occurs when they are "crossed." The degree of polarization is given by

$$\psi = P_{max} - P_{min} / P_{max} + P_{min}$$

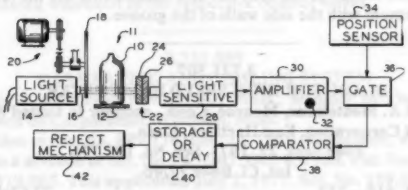
A quarter-wave plate which can be flipped into or out of the path of the light beam permits use of the instrument using circular polarization techniques.

3,721,501

METHOD AND APPARATUS FOR MONITORING SURFACE COATINGS

Everett J. Atkinson; James R. Sager, both of Toledo, Ohio, and Alan C. Bensch, Lowell, Mass., assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Jan. 4, 1971, Ser. No. 103,566
Int. Cl. G01n *21/06, 31/00;* **B07c** *5/34*
U.S. Cl. 356—201 **9 Claims**



There is disclosed herein in a preferred embodiment a method and apparatus for determining whether the layer of high alkali glass on the inside of a glass bottle has been effectively neutralized by the introduction of an acidic compound into the interior of the glass bottle. The method includes the steps of passing a beam of light through the bottle, and filtering the light beam to pass only a range of wave lengths which will be scattered, absorbed or otherwise inhibited by the presence of a coating on the inside of the bottle which has resulted from the reaction of the acidic compound and the layer of high alkali glass. The filtered light beam is sensed to determine the amount of light in the range of wave lengths which passes through the bottle and this is utilized as a measure of the effectiveness of the neutralization process. In the preferred embodiment the filtering step includes limiting the range of wave lengths to detect the amount of sodium sulphate in the coating on the inside of the bottle as the measure of the effectiveness of the neutralization process.

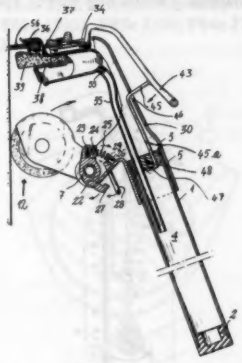
3,721,502

PORTABLE APPARATUS FOR CLEANING WINDOW-PANES OR THE LIKE

Pietro Ognibene, Via Lanzoni, 277, Villarotta, Italy

Filed Aug. 17, 1971, Ser. No. 172,394
Claims priority, application Italy, Aug. 28, 1970, 29132 A/70
Int. Cl. A47l *1/08*
U.S. Cl. 401—13 **5 Claims**

A portable apparatus for cleaning window-panes or the like, substantially comprising a handle carrying a roller swinging against a spring and containing a detergent liquid capable of emerging from small valves which are pressed against the roller surface as the roller rotates, a squeegee being provided for removing the detergent liquid by spongy squeezable collecting means and means for conveying the squeezed liquid into a reservoir provided in said handle.

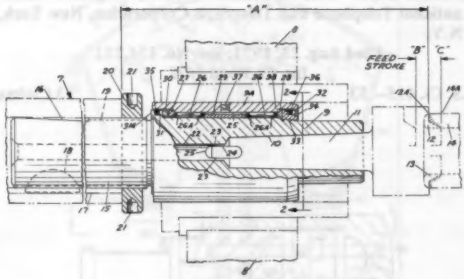


3,721,503

ROTARY TOOL HOLDER

Bernard H. Johnson, Plymouth, Mich., assignor to Gatco Rotary Bushing Company, Plymouth, Mich.

Filed Feb. 8, 1971, Ser. No. 113,356
Int. Cl. B23b *51/12*
U.S. Cl. 408—238 **5 Claims**



This Application discloses a wear free, precision, holder for a machine tool such as used for cutting, boring, end facing and the like. The invention resides in the particular combination and arrangement of elements and particularly in the provision of a holder having a fixed concentric shell portion and a rotatable body portion, with a plurality of small diameter needle roller bearings positioned between the said shell and said body to effect a closely spaced, frictionless, working relation between said fixed and rotatable portions.

3,721,504

VERTICALLY ADJUSTABLE CENTRIFUGAL PUMP FOR USE IN MANHOLES

Angelo J. Crisafulli, P.O. Box 1051, Glendive, Mont.

Filed Feb. 18, 1971, Ser. No. 116,498
Int. Cl. F01d *13/00, 15/00;* **F04b** *17/00*
U.S. Cl. 415—74 **10 Claims**

A portable centrifugal pump for use in vertically extending cavities such as a manhole. A centrifugal pump having a force

feed blade assembly is located in the cavity and empties into a discharge duct extending upward out of the cavity. A drive shaft extends downward from a gear box located above the cavity and drives the pump. The gear box is adjustable to accommodate horizontally extending power shafts at varying

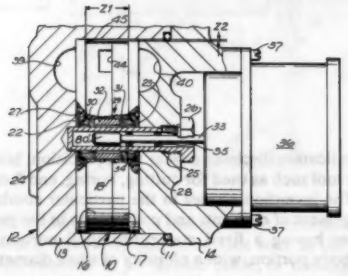
heights. The pump may be adjustably positioned at varying depths through the use of a vertically adjustable transverse support member which mounts the centrifugal pump in the cavity and is supported by a depending framework from the bottom of the cavity.

3,721,505

FLUID MOTOR

Lawrence Taylor Garnett, Fullerton, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Aug. 25, 1971, Ser. No. 174,711
Int. Cl. F04d *5/00*
U.S. Cl. 415—53 **13 Claims**



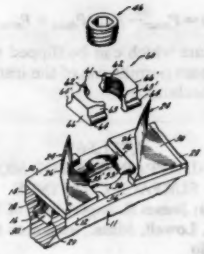
A flowmeter, the total angular travel of which is directly proportional to the total volume of a fluid flowing therethrough. A revolutions counter-indicator or the like is driven by a fluid motor having a bypass. The bypassed flow is turbulent over the otherwise linear portion of the motor curve and laminar at flow rates below the lowest turbulent flow rate. The bypass thus increases the range and accuracy of the flowmeter at low flow rates. A certain ratio greater than unity of inlet and outlet areas produces the same result as do internal ribs inside the motor housing.

3,721,506

SPLIT-NUT BLADE LOCKING ASSEMBLY

Bernard Joseph Anderson, Danvers, Mass., assignor to General Electric Company, Lynn, Mass.

Filed May 25, 1971, Ser. No. 146,732
Int. Cl. F01d *5/32*
U.S. Cl. 416—215 **7 Claims**



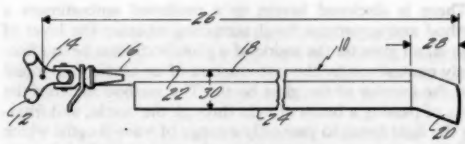
A split-nut blade locking assembly, for maintaining the circumferential integrity of blades peripherally disposed within a groove around a rotor element includes a split-nut within which a set screw may be threadably engaged for spreading apart the halves of the split-nut and maintaining the halves in engagement with the side walls of the groove.

3,721,507

BLADE FOR HIGH SPEED HELICOPTER

Robert A. Monteleone, Monroe, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed Sept. 22, 1971, Ser. No. 182,776
Int. Cl. B64c *27/46*
U.S. Cl. 416—223 **27 Claims**



To alleviate a helicopter blade instability which manifests itself as a submiltiple oscillation of the rotor tip path plane during high speed flights, the blade tip is thinned between its inboard end and its outboard end so that the outboard end is approximately one half the thickness of the inboard end, while the tip chord remains substantially constant, and the blade tip is swept rearwardly to shift its aerodynamic center rearwardly and thereby establish a moment to counteract the instability and preferably, the blade tip is selectively cambered to delay retreating blade stall.

3,721,508

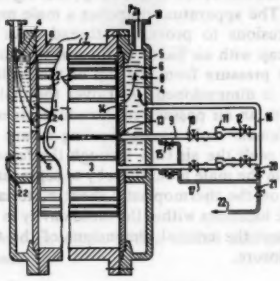
LIQUID-RING PUMP WITH CONTROL VALVES

Kurt Mugele, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Continuation-in-part of Ser. No. 871,868, Oct. 28, 1969, abandoned. This application May 11, 1971, Ser. No. 142,340
Claims priority, application Germany, April 26, 1969, P 19 21 430.3
Int. Cl. F04c *19/00*
U.S. Cl. 417—68 **9 Claims**

Liquid-ring pump includes a vane rotor, a housing structure enclosing the rotor and having suction and compression ports

communicating with intervane spaces of the rotor at respective suction and pressure localities thereof, pump outlet means, pressure-responsive control valves located outside the housing structure, pressure lines connecting the control



valves, respectively, with the compression ports of the housing structure, the valves having respective outlets communicating with the pump outlet means, and shut-off valve means serially connected with each of the respective control valves.

3,721,509

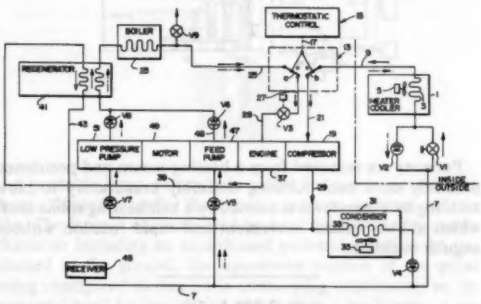
GAS HEATING AND COOLING SYSTEM

Sotiris S. Kitrilakis, Newtonville, Mass., assignor to Thermo Electron Corporation, Waltham, Mass.

Division of Ser. No. 889,774, Dec. 22, 1969, abandoned, which is a division of Ser. No. 765,207, Oct. 4, 1968, Pat. No. 3,519,065. This application July 2, 1971, Ser. No. 159,560

Int. Cl. F01b *23/08*

U.S. Cl. 417—339 **2 Claims**



A gas fired temperature control unit for air conditioning and heating, comprising two interconnected units, one adapted to be mounted outside and one inside the space to be heated or cooled. The outside unit comprises a hermetically sealed housing in which there is a five-stage fluid processing system comprising a compressor, a Rankine cycle engine, a feed pump, an electric motor, and a low pressure liquid pump. Located in a common ventilated housing with this hermetically sealed unit are a condenser, a boiler, a regenerator and a fluid reservoir. The inside unit comprises a heat exchanger which serves as an evaporator for air conditioning and as a condenser for heating. The inside and outside units are interconnected by valving under thermostatic control that connects the apparatus either as a heater or as an air conditioner in dependence on the temperature in the space to be controlled.

3,721,510

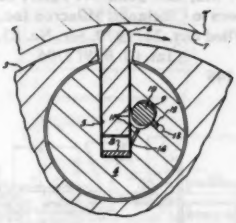
ROTOR APEX SEAL DAMPING DEVICE

William W. Gilbert, 372 South Williamsbury, Birmingham, Mich.

Filed June 25, 1971, Ser. No. 156,900

Int. Cl. F01c *19/02*; F03c *3/00*; F04c *27/00*

U.S. Cl. 418—113 **5 Claims**



A mechanism to damp vibration and chatter in the rotor apex seals of rotary internal combustion engines, pumps, compressors and other devices of generally epitrochoidal motion.

3,721,511

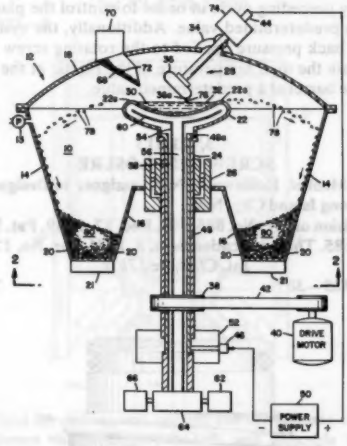
ROTATING ARC FURNACE CRUCIBLE

Max P. Schlienger, 136 Mitchell Boulevard, San Rafael, Calif.

Filed Feb. 18, 1971, Ser. No. 116,429

Int. Cl. B29c *23/00*

U.S. Cl. 425—8 **10 Claims**



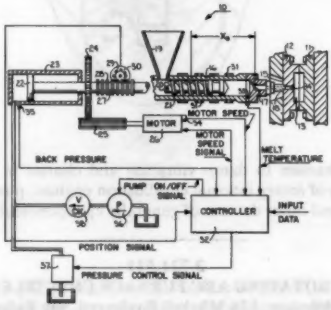
A method and apparatus for the melting of metallic scrap or other meltable material and the conversion of the molten material into shot or splatter. An arc furnace is provided incorporating a rotatable melt crucible with appropriate drive and cooling systems within an evacuated or controlled atmosphere enclosure. A rotating electrode wheel is positioned above the surface of the crucible in arc-forming proximity to the melt contained therein and a voltage source is applied between the electrode wheel and crucible to produce an arc of sufficient intensity to melt the materials involved. The crucible is rotated during the melting to vary the point of arc impingement on the melt surface. When a sufficient amount of molten material is contained within the crucible the rotational speed of the crucible is increased to cause molten material to leave the crucible at its periphery in the form of droplets

which contact the enclosure wall and solidify in the form of shot or splatter. The solid material is collected in a torroidal shaped hopper section at the bottom of the enclosure to be removed through hatch doors.

3,721,512
PLASTICATION CONTROL SYSTEM FOR INJECTION MOLDING MACHINES

Carlton Y. W. Ma, and John W. Peter, both of Cincinnati, Ohio, assignors to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Oct. 22, 1970, Ser. No. 83,072
Int. Cl. B29f *1/06*
U.S. Cl. 425—149 **8 Claims**

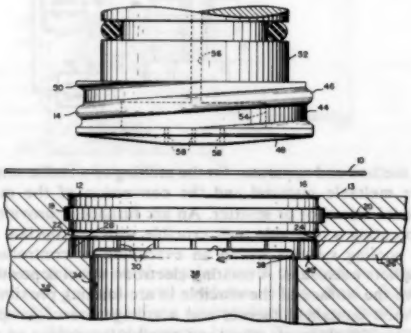


A plastication control system for controlling the shot size and plastication time of an injection molding machine. The control system includes a computer which calculates the screw speed based on the operating conditions of the immediately preceding cycle in order to control the plastication time to a predetermined value. Additionally, the system controls the back pressure applied to the rotating screw in order to maintain the melt temperature of the plastic at the forward end of the barrel at a predetermined value.

3,721,513
SCREW CAP CLOSURE

Gary G. Menkel, Holliswood, N.Y., assignor to Design Center, Inc., Long Island City, N.Y.

Division of Ser. No. 885,845, Dec. 17, 1969, Pat. No. 3,651,185. This application Sept. 3, 1971, Ser. No. 177,691
Int. Cl. B29c *17/04*
U.S. Cl. 425—387 **7 Claims**

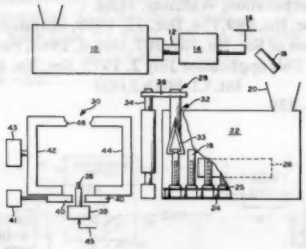


A method and apparatus for thermoforming a screw cap closure wherein a flat sheet or web of thermoplastic material is initially heated and placed over a female mold cavity and a mating male mold is pressed against the heated plastic sheet to draw a portion of the sheet into the female mold cavity. Air is injected into the mold at two points; the first being through the top of the male mold thereby to expand the plastic sheet against the lower portion of the female mold and the second is through the upper portion of the female mold to force the sheet to conform tightly against thread forming contours which are provided on the male mold. The male mold is then withdrawn bringing the formed cap in the web with it and the mold is twisted out of the formed cap, leaving the formed cap in the web. The apparatus comprises a male mold having external protrusions to provide a thread form on the thermoformed cap with air passages therein to allow the passage of air under pressure from the top of the mold. The female mold cavity is dimensioned to fit over the male mold and is provided with an air passage to introduce air under pressure within the female mold cavity. Sealing means in the female mold cavity seals the air flow through the female mold from the air flow in the male mold thereby to segregate the air pressure acting on the thermoplastic sheet material into at least two separate locations within the mold cavity in order to more closely control the critical dimensions of the thermoformed screw cap closure.

3,721,514
BLOW MOLDING APPARATUS INCLUDING BALL SPLINE SHAFT FOR RAPID AND PRECISE PARISON TRANSFER

Michael R. Harris, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 18, 1971, Ser. No. 172,744
Int. Cl. B29d *23/03*
U.S. Cl. 425—387 **7 Claims**



Parisons are removed from a heating means and positioned precisely on a neck forming assembly preparatory to blow molding by a transfer arm carried by a ball bearing spline shaft which allows vertical movement and rapid rotation without angular backlash.

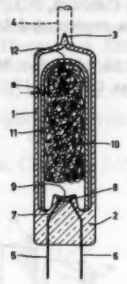
3,721,515
COMBUSTION FLASH BULB

Anton Boekkool; Adrianus Antonius Hurx, both of Eindhoven; Johannes Cornelis Edward van der Tas, Terneusen, and Charles Cornelis Edward Meulemans, Eindhoven, all of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 2, 1971, Ser. No. 194,888
Claims priority, application Netherlands, Nov. 5, 1970, 7016182
Int. Cl. F21k *5/02*
U.S. Cl. 431—95 **5 Claims**

A combustion flash bulb ignited by means of a piezo-electric ignition in which, to protect the wall of the envelope, a separate tubular inner envelope is arranged in the envelope, said inner envelope being open at its end facing the lamp base and comprising the metal wool to be burned. In order to attenuate the shock wave occurring during the combustion in the

inner envelope, said inner envelope comprises opposite to the open tube end a narrowed end in which an aperture is provided. The inner envelope is thin-walled and manufactured from a soft glass.

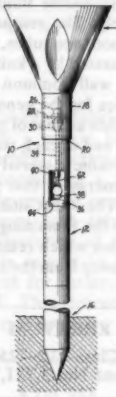


3,721,516

PORTABLE LAMP

James D. Reese, 11937 Avenue 274, Visalia, Calif.

Filed June 21, 1971, Ser. No. 154,994
Int. Cl. F23d
U.S. Cl. 431—202 5 Claims



A portable lamp particularly suited for use in providing a flame of burning gas for illuminating gardens, terraces and the like. The lamp is characterized by a tubular pillar of portable character including an acuminated pedestal suited to be implanted in the ground, the uppermost portion of the pillar being configured to receive in telescoping relationship an ornamental head having affixed therewithin a gas burner, a gas delivery circuit including a pressure bottle suspended from the burner and received within the pillar, and a manipulatable flow control valve interposed between the burner and the bottle for controlling delivery of gas from the bottle to the burner.

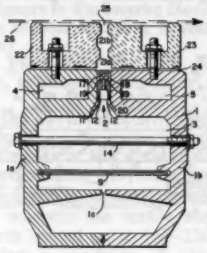
3,721,517

GAS FUELED SINGEING BURNER FOR FLAT TEXTILES

Walter Osthoff, Essener Strasse 62, Wuppertal-Sonnborn, Germany

Filed May 12, 1971, Ser. No. 142,722
Claims priority, application Germany, May 15, 1970, P 20 23 782.5
Int. Cl. F23d *15/00*
U.S. Cl. 431—353 9 Claims

A gas fueled singeing burner for singeing treatment of flat textiles having an elongated burner body, preferably of extruded aluminum in two sections which are bolted together, a gas chamber in the body, longitudinally extending burner slits formed by two parallel straight line openings in communication with the gas chamber via a longitudinal gap whose width is equal to the distance between the burner slits and on which is fitted an elongated distributor strip having indented upper portions forming the burner slits. Tightening of the body sections also tightens the distributor slits. Cooling passageways may be provided above the gas chamber and on each side of the distributor refractory, bricks may be bolted to the top on each side of the flame from the slits.

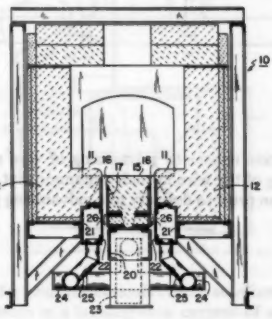


3,721,518

METHOD FOR SEALING AND COOLING THE COMPONENT PARTS ASSOCIATED WITH THE MOVING AND STATIONARY MEMBERS OF WALKING BEAM FURNACES

Charles R. Wilt, Jr., Pittsburgh, Pa., assignor to Salem Corporation, Pittsburgh, Pa.

Filed March 8, 1971, Ser. No. 121,850
Int. Cl. F27b *17/00*
U.S. Cl. 432—4 4 Claims



A method for sealing and cooling the component slot members between the stationary hearth and movable beam or beams in walking beam furnaces by injecting air into the slot in such a manner that the air jets create a stagnation plane within the slot to maintain an equilibrium with the furnace pressure while impinging on the beam members and simultaneously cooling it.

3,721,519

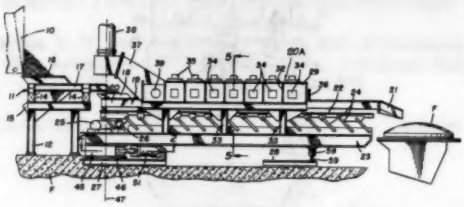
FURNACE CHARGING APPARATUS

Henry J. Venetta, Warren, Ohio, assignor to Venetta Engineering, Warren, Ohio

Filed Sept. 24, 1970, Ser. No. 75,075
Int. Cl. F27d *3/00*
U.S. Cl. 432—88 9 Claims

Apparatus for charging a plurality of melt furnaces, including a horizontally disposed conveyor, preferably of the vibrator feeder type, having one end adapted to receive charge

material and its other end adapted to feed the material into any one of said furnaces, and a pre-heat furnace overlying the conveyor for preheating the charge material. The conveyor and furnace are carried by a common support frame which is pivoted about a vertical pivot so that the conveyor and furnace may be swung horizontally to alignment with any one fur-



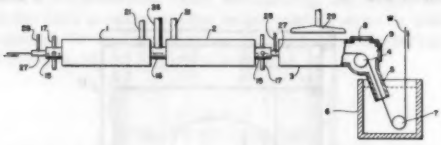
nace. The pre-heat furnace has a rotatable connection with an exhaust stack, which connection is concentric with the vertical pivot. In a further embodiment of the invention, a subframe supports the conveyor from the support frame so that the conveyor may be moved toward and away from the furnaces to compensate for variance in distance between the discharge end of the conveyor and the furnaces.

3,721,520

GALVANIZING WIRE

Quentin M. Bloom, Dresher, Pa., assignor to Selas Corporation of America, Dresher, Pa.

Division of Ser. No. 750,338, Aug. 5, 1968, abandoned. This application Sept. 2, 1971, Ser. No. 177,417
Int. Cl. F27b *9/28*
U.S. Cl. 432—143 **4 Claims**



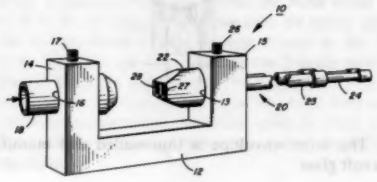
The invention relates to galvanizing of wire and shows the direct heating of the wire in such a manner that it is protected from oxidation prior to delivery to a galvanizing pot.

3,721,521

APPARATUS FOR CONVERTING PRESSURE ENERGY TO THERMAL ENERGY

Albertus E. Schmidlin, Caldwell, N.J., assignor to The United States of America as represented by the Secretary of the Army

Filed April 30, 1971, Ser. No. 139,111
Int. Cl. F27b *17/00*
U.S. Cl. 432—227 **17 Claims**



Apparatus is provided for converting pressure energy to thermal energy which includes a means for directing a high velocity flow of a compressible fluid at the open end of a resonance tube assembly. The resonance tube assembly includes a plurality of resonance tubes, the inlet ends of which are juxtaposed and separated by a knife-edge wall. The provision of the knife-edge wall common to the passages of the resonance tubes provides for the generation of oscillations of gas within each tube which are out of phase with oscillations in other tubes. The closed end of each resonance tube preferably embodies a mass of metallic material to define a "heat sink" for retaining thermal energy in that portion of the tube adjacent the closed end. The "heat sink" portion of the tube is thermally isolated from the remaining portions of the tube by a thin walled tube section which retards the flow by conduction of thermal energy away from the closed end of the tube.

ERRATUM

For Class 432—25 see:
Patent No. 3,721,728

3,721,522

METHOD FOR SCOURING AND DYEING SILK IN A SINGLE OPERATION

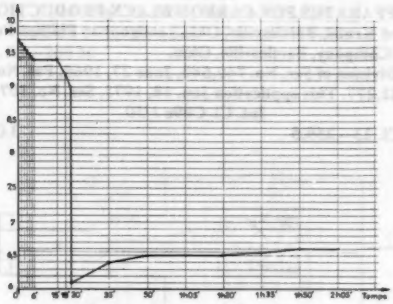
Raymond Machon, Alles des Muriers; Jean Flechet, Bd.de la Loire, Maison Hugo; and Etienne Hugo, 21 Rue Gambetta, all of Saint-Just-sur-Loire, Loire, France

Filed Nov. 4, 1969, Ser. No. 873,857

Claims priority, application France, June 11, 1969, 6919242

Int. Cl. D06p *5/00*

U.S. Cl. 8—19 10 Claims



The silk in skein, thread or fabric shape is treated in a single operation inside a single bath with degumming reagents and with dyestuffs. To this end, the silk is soaked in an aqueous bath containing a tension-active reagent and with which the degumming reagent and dyestuffs are incorporated in sequence with intermediate stirring periods provided by a circulation of the bath over the silk. The pH of the bath is caused to drop sharply through addition of sulfuric acid for instance from 9 to 10 down to 5 or even 6 to 6.5. This procedure reduces the handling of the silk to a minimum.

3,721,523

MODIFICATION OF REACTIVE HYDROGEN CONTAINING POLYMERS WITH AMINO EPOXY PHOSPHONATES

Giuliana C. Tesoro, Dobbs Ferry, N.Y., assignor to J. P. Stevens & Co., Inc., New York, N.Y.

No Drawing. Original application June 24, 1966, Ser. No. 560,101, now Patent No. 3,528,998. Divided and this application May 22, 1970, Ser. No. 38,636

Int. Cl. D06m *13/10, 13/32, 13/44*

U.S. Cl. 8—196 13 Claims

Amino epoxy phosphonates, such as 1-amino-2,3-epoxypropylphosphonates and N-substituted derivatives thereof, including polyphosphonates and silyl phosphonates, can be homopolymerized, or reacted with active-hydrogen-containing polymers, such as cellulose, and the silyl derivatives can be reacted with glass. These compounds thus have utility as flame-retardant and cross-linking agents for cellulose, as finishes for glass surfaces, and as coupling agents for glass fiber-thermosetting plastic laminates.

3,721,524

PROCESS FOR THE DYEING OF TEXTILE MATERIALS OF HIGH MOLECULAR POLYESTER FIBRES

Hans-Ulrich von der Eltz, Frankfurt am Main, Richard Gross, Munich, and Walter Birke, Frankfurt am Main, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed Feb. 10, 1970, Ser. No. 9,988

Claims priority, application Germany, Feb. 12, 1969, P 19 06 842.9

Int. Cl. D06p *5/04, 5/06*

U.S. Cl. 8—169 4 Claims

Continuous process for the dyeing of textile materials made from high molecular polyester fibres or containing such fibres with disperse dyestuffs and/or organic pigment dyestuffs, wherein the textile material is treated with a dyeing bath heated up to 160–230° C. which consists of oxalkylation products of aliphatic, aromatic, alkylated aromatic or cyclo-aliphatic compounds or of polyglycol ethers, and in which the dyestuffs are dissolved or dispersed.

3,721,525

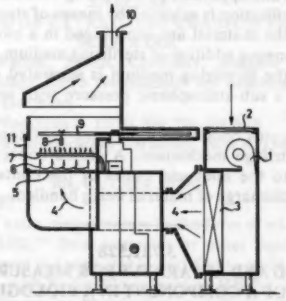
PROCESS AND DEVICE FOR STERILIZING BY FLAMING CONTAINERS FOR PHARMACEUTICAL PREPARATIONS

Hans-Peter Hortig, Frankfurt am Main, and Karl-Friedrich Schutz, Wiesbaden, both of Germany, assignors to Farbwerke Hoechst Aktiengesellschaft Vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

Filed July 15, 1971, Ser. No. 162,974

Int. Cl. A61l *1/00*

U.S. Cl. 21—2 2 Claims



Containers for pharmaceuticals can be sterilized by flaming, if the flames burn in a laminar-flow current of air, with little risk of contamination. A device for flame-sterilizing such containers is fitted out with means to produce a laminar-flow air current through the sterilizing part of the device.

3,721,526

INHIBITION OF CORROSION IN HOT CARBONATE CARBON DIOXIDE REMOVAL UNITS

Zisis Andrew Foroulis, East Orange, N.J., and Brian Eric Hopkinson, Judibana, Estado Falcon, Venezuela, assignors to Esso Research and Engineering Company, Linden, N.J.

Filed July 17, 1970, Ser. No. 55,943

Int. Cl. C23f *11/06*

U.S. Cl. 21—2.7 6 Claims

Corrosion of metals and alloys by alkali metal carbonate solutions is greatly reduced by adding to the solution at least about 1.5 percent by weight, and preferably about 2 to 5 per-

cent by weight, of an alkali metal nitrite. Carbon steel is among the alloys which can be protected. Typical solutions are the hot carbonate solutions used to scrub carbon dioxide from gas mixtures.

3,721,527

METHOD FOR STERILIZING BULK MATERIALS

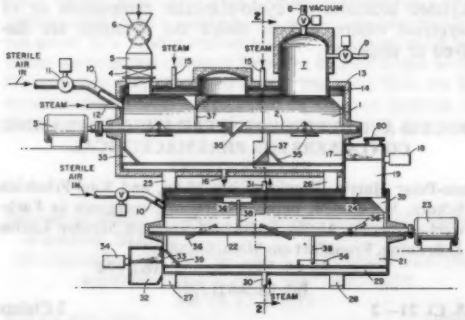
Wilhelm Lodige; Fritz Lodige; Josef Lucke, all of Paderborn, Germany, and Theodor Ernst, Wettingen, Switzerland, assignors to Wilhelm Lodige; Fritz Lodige and Josef Lucke, by said Theodor Ernst, Paderborn, Germany

Continuation-in-part of Ser. No. 760,803, Sept. 19, 1968, abandoned. This application Feb. 18, 1971, Ser. No. 116,539

Claims priority, application Germany, Oct. 10, 1967, P 16 42 087.4

Int. Cl. A61l *13/00, 1/00*

U.S. Cl. 21—56 **6 Claims**



A method and apparatus for sterilizing bulk materials. In the method, sterilization is achieved by means of steam or hot gas. Batches of the material are centrifuged in a closed chamber with simultaneous addition of sterilizing medium. Immediately thereafter, the sterilizing medium is separated out from the material at a sub-atmospheric pressure with centrifuging of the material.

The apparatus comprises a pressure-tight container with a built-in centrifuge mechanism. A closed conveyor device is connected to the inlet and outlet of the container, for the supply and discharge of material being handled.

3,721,528

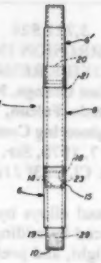
METHOD AND APPARATUS FOR MEASURING THE AMOUNT OF A COMPONENT IN A BIOLOGICAL FLUID

Louis W. Mead, 38 Somerset Road, Lexington, Mass., and Marshall E. Deutsch, 41 Concord Road, Sudbury, Mass.

Filed June 4, 1970, Ser. No. 43,488

Int. Cl. G01n *33/16, 23/12;* **G21h** *5/02*

U.S. Cl. 23—230 B **8 Claims**



An improved mode of preparing certain reagents utilized in the measurement of components of biological fluids. In the general mode contemplated, there is added to the biological fluid, which normally contains a binder (i.e. a protein) capable of binding the component to be measured, a combination of a component essentially similar to that which is to be measured as present in the biological fluid but modified to act as a tracer (by reason of its optical or radio-active properties) and an adsorbent. The tracer modified component is added in an amount greater than that capable of being bound by the binder present in the fluid. The adsorbent material is added to remove the unbound components, the adsorbent removed, and the amount of tracer in the liquid phase measured.

The improvements comprise the use of a milder adsorbent then theretofore used and a modification in the construction of the vials to carry out the measurements.

3,721,529

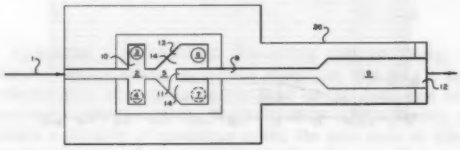
APPARATUS FOR CARBON BLACK PRODUCTION

Gerard Kraus, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 740,540, June 27, 1968, Pat. No. 3,582,277. This application Jan. 18, 1971, Ser. No. 107,078

Int. Cl. C09c *1/50*

U.S. Cl. 23—259.5 **3 Claims**



Apparatus for the production of carbon black wherein a hydrocarbon feed is contacted with two generally countercurrent impinging masses of hot combustion gases and the resulting mixture passed into a reaction zone wherein the hydrocarbon feed is pyrolytically decomposed into carbon black.

3,721,530

REACTOR FOR PREPARATION OF CHLOROHYDRINS OF 1,2-GLYCOLS

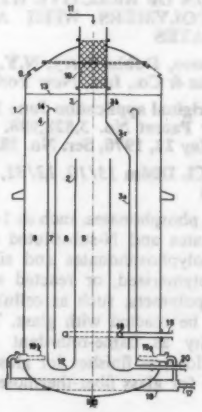
Robert Bouchet, Martigues, France, assignor to Naphtachimie, Paris, France

Filed Jan. 12, 1971, Ser. No. 105,917

Claims priority, application France, Jan. 13, 1970, 7000985

Int. Cl. C07c *17/02;* **B01j** *1/00*

U.S. Cl. 23—285 **5 Claims**



A chemical reactor comprising a generally cylindrical reaction vessel, a series of three jackets defining a central chamber and three annular chambers within the reactor, means for

feeding a first gaseous reactant, such as chlorine, to the lower portion of the first annular chamber to displace liquid reaction medium therein to the centrally disposed chamber for flow downwardly therethrough, means for introducing a second gaseous reactant, such as an ethylenic hydrocarbon, to the third annular chamber to cause flow of the liquid reaction medium therein upwardly therethrough to the second annular chamber for reaction with the reaction product of the chlorine and water in the liquid reaction medium to thereby minimize the production of chlorinated alkanes.

3,721,531

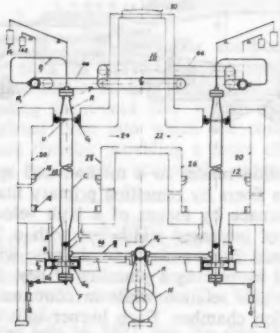
STEAM-HYDROCARBON REFORMER WITH A SUPPORT SYSTEM FOR CATALYST TUBES THEREIN

Mehmet Fahri Tuncer, 110 East 36 Street A.P. 3C, New York, N.Y.

Filed Aug. 30, 1971, Ser. No. 175,934

Int. Cl. B01j *9/04*; F22b *37/24*; F28f *5/00*

U.S. Cl. 23—288 M **7 Claims**



A steam-hydrocarbon reformer which includes a source of a gaseous charge with parallel inlet manifolds being coupled to the source. Two parallel rows of vertical catalyst tubes are provided which are connected by inlet tubes to the inlet manifolds. One outlet manifold is provided which is connected by outlet tubes to the catalyst tubes. A counterweight system suspends the catalyst tubes in vertical attitude to relieve the inlet and outlet tubes of the weight thereof. A system is provided at the bottoms of the catalyst tubes permitting horizontal movement of the same but restricting vertical movement thereof. A further counterweight system acts on the bottoms of the catalyst tubes to put the outlet tubes under tension. Sheets are arranged at the tops of the catalyst tubes to which latter freely extend to accommodate thermal expansion of the catalyst tubes. The catalyst tubes are connected together in their respective rows. The inlet manifolds and sheets are supported at the centers thereof to permit outward thermal expansion in opposite directions. A further counterweight system is provided for supporting the inlet manifolds.

3,721,532

AMMONIA SYNTHESIS SYSTEM

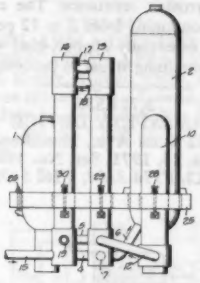
Lee E. Wright, West Covina, and Allan E. Pickford, Palos Verdes Estates, both of Calif., assignors to C. F. Braun & Co., Alhambra, Calif.

Filed Feb. 8, 1971, Ser. No. 113,333

Int. Cl. B01j *9/04*; C01c *1/04*; F28d *7/06*

U.S. Cl. 23—289 **5 Claims**

A system of apparatus and process for synthesizing ammonia are disclosed, which includes first and second catalytic synthesis converters with a heat exchanger interposed therebetween and operatively connected to the inlet and outlet of one converter and to the inlet of the other converter to permit a feed gas stream to be passed in heat exchange relationship with a partially synthesized gas stream passing from the outlet of the first converter to the inlet of the second converter. The converters and heat exchanger are mounted on a support platform, with one converter and heat exchanger mounted for movement with respect to the platform to accommodate dimensional changes caused by thermal expansion during operation.



3,721,533

METHOD OF EXTRACTING URANIUM FROM SEAWATER

Hans-Jurgen Riedel, Julich, Germany, assignor to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung, Julich, Germany

Filed June 8, 1970, Ser. No. 44,628

Claims priority, application Germany, June 6, 1969, P 19 28 864.3

Int. Cl. C01g *56/00*

U.S. Cl. 23—337 **10 Claims**

A method of extracting uranium in the form of tri-carbonate complexes of UO_3^{++} from seawater or other liquids rich in metal ions wherein the seawater is acidified to a pH of approximately 5 (e.g. with hydrochloric acid or HNO_3) and then is treated with ultramarine blue in an ion-exchange relationship until equilibrium is reached in the distribution of uranium between the ultramarine blue and the seawater. Elution of the uranium is carried out with an alkali carbonate solution.

3,721,534

METHOD OF FORMING PROTECTIVE COATINGS ON FERROUS METAL AND THE RESULTING ARTICLE

Richard J. Kubick, Queens County, Beechhurst, N.Y., assignor to GTE Sylvania Incorporated, Detroit, Mich.

Filed Sept. 1, 1971, Ser. No. 177,103

Int. Cl. B32b *15/00*, *15/04*

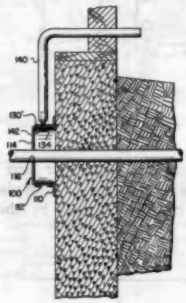
U.S. Cl. 29—195 **8 Claims**

A composite comprising a ferrous metal substrate and three layers of specific materials is disclosed. The first layer is nickel aluminide, the second layer is a nickel-chromium alloy and the third layer is an aluminum oxide ceramic. A process for producing the composite is also disclosed which comprises depositing the layers in a specific order under controlled temperature conditions.

3,721,535
COMPOSITE COPPER ALLOY
Michael J. Pryor, Woodbridge, and Robin P. M. Procter, North Haven, both of Conn., assignors to Olin Corporation, New Haven, Conn.
Filed Jan. 25, 1971, Ser. No. 109,125
Int. Cl. B23p 3/00
U.S. Cl. 29—199 6 Claims

The disclosure teaches a novel, composite copper alloy having good stress corrosion resistance. The composite has a copper alloy core containing from 2 to 12 percent by weight aluminum, balance essentially copper, clad with copper or a high copper alloy containing at last 95 percent copper.

3,721,536
GAS SAFETY DEVICE
John D. Lakes, 762 Ross Ave., Hamilton, Ohio 45013
Filed Jan. 26, 1971, Ser. No. 109,773
Int. Cl. F17d 3/04; F16l 5/00
U.S. Cl. 48—193 2 Claims

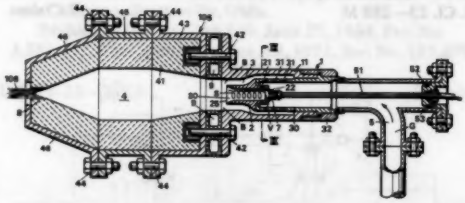


Device for trapping gas leaks at the juncture of a gas lead-in pipe and a building wall, including an exhaust pipe having a flexible connection to the trap chamber to allow for shifting between portions of the building.

3,721,537
METHOD FOR CLADDING POLYGONAL CROSS-SECTION LASER
Amadee D. Mario and Clifford W. Ask, Sr., Woodstock, Mass., assignors to American Optical Corporation, Southbridge, Mass.
Filed Feb. 16, 1971, Ser. No. 115,495
Int. Cl. C03c 23/20
U.S. Cl. 65—4 5 Claims

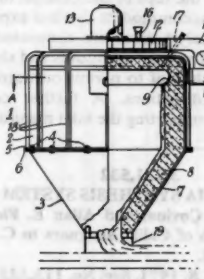
A side of a polygonal cross-sectioned glass laser rod core may be clad by applying a slab of a suitable cladding glass material thereto. The fusing of the slab to the core without the formation of entrapped gas bubbles therebetween is accomplished by allowing the slab to rest in essentially line contact with the side of the core at the end adjacent a suitable drawing furnace. The other end of the slab is spaced away from the core material. Means is provided for urging the slab of cladding material toward the side of the core such that as the core and cladding material are drawn within the drawing furnace, the line of contact between the core and cladding gradually traverses the length of the core and cladding thereby forcing any gas out of the space which exists between the core and cladding to provide a bubble-free interface in the resulting clad glass laser rod.

3,721,538
BURNER APPARATUS AND METHOD FOR MANUFACTURING OF GLASS WOOL
Kiwamu Okuma and Takeo Abe, Koriyama, Japan, assignors to Paramount Glass Mfg. Co., Ltd., Koriyama City, Fukushima-ken, Japan
Filed Dec. 22, 1971, Ser. No. 210,768
Claims priority, application Japan, Dec. 23, 1970, 45/116,972
Int. Cl. C03b 37/06
U.S. Cl. 65—7 11 Claims



This invention relates to a method and apparatus for forming glass fibers by remelting primary filaments from a melting furnace by means of a high velocity jet uniform flame of increased width but with a lower width ratio of unused flame ends to total flame width. This is accomplished by placing a plurality of new burner units in a side by side relation while in communication with the combustion chamber. Each burner unit comprises a flame holder utilizing converging streams of combustible gas surrounded by a spiral configurated stream around both of which is enveloped a third stream.

3,721,539
CONSTRUCTION PROCESS AND APPARATUS FOR FORMING CERAMIC WALLS
Robert Julian Hansford, Tirley Garth, Tarporley, Cheshire, England
Continuation of Ser. No. 796,692, Feb. 5, 1969, abandoned.
This application June 3, 1971, Ser. No. 149,782
Claims priority, application Great Britain, Feb. 7, 1968, 6,173/68
Int. Cl. C03b 5/04
U.S. Cl. 65—19 8 Claims



A method of heating raw material in which a stream of particles of raw material are fed through the hot zone of a heat source in a housing. The heat transforms the particles into a completely or partially molten state and the particles are then discharged from the housing. They may be deposited in moulds or in superposed successive layers.

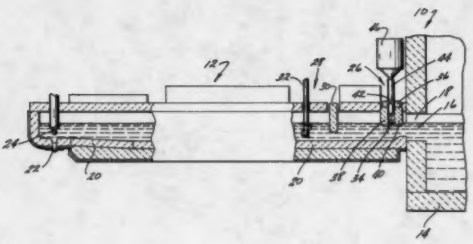
3,721,540
FOREHEARTH ADDITION SECTION

Friedrich W. Hammer, Toledo, Ohio, assignor to Owens-Illinois, Inc.

Continuation of abandoned application Ser. No. 648,063, June 22, 1967. This application Nov. 6, 1970, Ser. No. 87,596

Int. Cl. C03b 5/04

U.S. Cl. 65—27 5 Claims



Introduction of solid particulate compounds into a molten base glass by utilizing a forehearth addition section and automatic feeding equipment; the addition section including front and rear refractory blocks defining an isolated zone into which the compounds are discharged and thereby providing a more efficient, non-contaminating hygienically acceptable system.

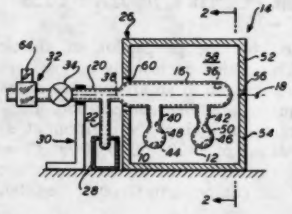
3,721,541
METHOD OF MANUFACTURE OF A NUCLEAR MAGNETIC RESONANCE CELL

James H. Simpson, Katonah, and Donald I. Shernoff, White Plains, N.Y., assignors to The Singer Company, Little Falls, N.J.

Filed July 26, 1971, Ser. No. 166,158

Int. Cl. C03c 25/02

U.S. Cl. 65—60 9 Claims



A method of manufacture of a nuclear magnetic resonance cell including, fabricating a manifold unit enclosing a chamber and having a side arm containing a deposit of mercury and having a bulb enclosing a cavity in communication with said chamber, heating said manifold unit and bulb for a predetermined time interval to a temperature approaching the softening temperature of the material of said bulb and simultaneously cooling said mercury deposit and said side arm to a temperature approaching that of liquid nitrogen and simultaneously evacuating the chamber and cavity to a relatively low pressure of about 10^{-7} torr vacuum, cooling said manifold and bulb to about room temperature and simultaneously gently heating the mercury in the side arm until a portion of the mercury is vaporized and distilled within the manifold chamber, separating the side arm from the manifold and bulb assembly and sealing said chamber after again evacuating the chamber and cavity to said relatively low pressure, cooling the manifold until the manifold reaches a temperature of about 25 degrees centigrade and simultaneously raising the temperature of the bulb until the bulb reaches a temperature of about 100 degrees centigrade and maintaining said temperatures for a predetermined time interval, and separating the bulb from the manifold and simultaneously sealing the bulb while simultaneously maintaining said temperatures of the manifold and bulb, and heat cycling the sealed bulb for a plurality of cycles of heating and cooling for a predetermined time interval.

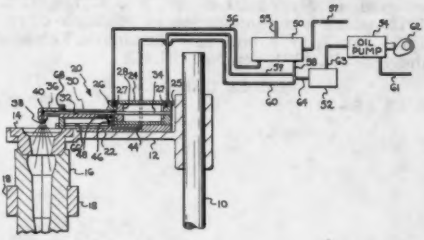
3,721,542
FUNNEL ARM MOUNTED MOLD LUBRICATION APPARATUS

Robert H. Keller, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed July 15, 1971, Ser. No. 162,809

Int. Cl. C03b 39/00

U.S. Cl. 65—169 6 Claims



A retractable lubrication unit mounted on the funnel arm of a glass forming machine for introducing a lubricant into glass forming molds. A reciprocating lubrication apparatus is mounted on the funnel arm of a glass forming machine and is operated to position a lubricant spray device over the funnel and retract the device during the period between seating of the funnel on the parison mold and the delivery of a glass charge through the funnel. During the time the spray device is over the open funnel, a mist of lubricant is sprayed into the forming mold through the funnel to provide the important lubricious surface on the forming mold and funnel necessary for efficient machine operation.

3,721,543
FLOAT GLASS APPARATUS WITH MEANS FOR INSERTING WIRE

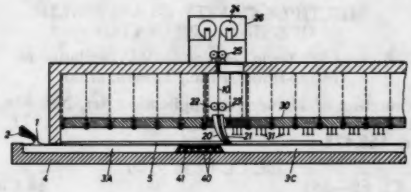
Franz Classen, Porz-Grengel, Germany, and Jean-Marc Parrot, Asnieres, France, assignors to Erste Deutsche Floatglas GmbH & Co. OHG, Porz, Germany

Filed June 9, 1969, Ser. No. 831,656

Claims priority, application Austria, June 14, 1968, A 5727/68

Int. Cl. C03b 18/00, 13/12

U.S. Cl. 65—146 2 Claims



A method and apparatus to make clear or transparent wire reinforced glass by the float process. Liquid glass, at a tem-

perature of about 1050° C., is brought to its finished width on a molten tin bath. A wire inlay is introduced downwardly into the upper surface of the liquid glass by wire guiding means which do not contact the glass. The surface of the glass in contact with the metal bath is cooled to make the glass strip stiffer. This is done to prevent the forces which act on the glass during the introduction of the wire inlay from pressing it into the tin bath, and to aid in controlling the depth to which the wire inlay penetrates it. After the wire inlay is introduced into the glass, heat is applied to the upper surface of the glass to form an even plane surface.

3,721,544

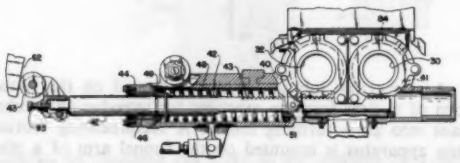
MOLTEN GLASS GOB DISTRIBUTION SYSTEM

Wasyl Bystrianyk, Hartford, and Francis A. Sarkozy, West Hartford, Conn., assignors to Emhart Corporation, Bloomfield, Conn.

Continuation of application Ser. No. 82,736, Oct. 21, 1970, which is a continuation of application Ser. No. 1,096, Jan. 7, 1970, both now abandoned. This application Nov. 17, 1971, Ser. No. 199,458

Int. Cl. C03b *5/30*

U.S. Cl. 65—207 **30 Claims**



A system for distributing successively formed groups of glass gobs from a feeder bowl to the several individual sections of a Hartford I.S. type glassware forming machine includes a single scoop for each gob in the group, and mechanism for rotating the scoops between successive positions wherein each is aligned with a chute associated with a particular mold cavity in each machine section. A "double-gob" installation is described and the two scoops have associated annular spur gears which are driven in unison by a reciprocable rack gear through a predetermined schedule of angular displacements to successively align the two scoops with several sets of paired chutes according to a particular order and to then repeat this schedule. A cam follower connected to the rack gear causes programmed movement thereof in response to rotation of a cam having lobes of predetermined height to produce the predetermined schedule of angular displacements of the scoops.

3,721,545

MULTIPLE-CAVITY GLASS MOLD OPENING APPARATUS

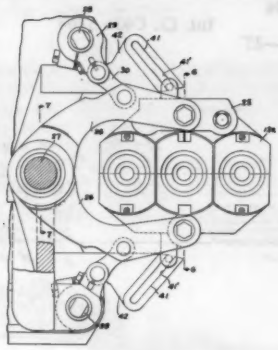
George W. Irwin, Holland, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Continuation of abandoned application Ser. No. 836,388, June 25, 1969. This application Aug. 2, 1971, Ser. No. 168,478

Int. Cl. C03b *9/40*

U.S. Cl. 65—261 **14 Claims**

A glass forming machine wherein a plurality of charges are formed into parisons at a parison molding station and thereafter transferred to a blow molding station where they are blown into shape. Means are provided for mounting the parison molds at the parison molding station in such a manner that they move away from one



another a predetermined distance sufficient to provide clearance.

3,721,546

METHOD FOR PRODUCTION OF ALUMINUM

Tadahisa Shiba, Junzo Tsuruki, Masaru Takahashi, Kunihiro Goto, and Isao Ono, Tokyo, Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo, Japan

No Drawing. Continuation-in-part of abandoned application Ser. No. 651,370, July 6, 1967. This application Aug. 11, 1970, Ser. No. 63,015

Claims priority, application Japan, July 13, 1966, 41/45,355, 41/45,356

Int. Cl. C22b *9/10, 21/02*; C22d *7/02*

U.S. Cl. 75—10 **1 Claim**

A method for the production of aluminum of high purity which consists exclusively of the steps of reducing alumina with carbon in an arc furnace, thereby obtaining an aluminum-containing composition, then maintaining the aluminum-containing composition at a temperature within the range of 1400° C. to 2000° C. on a filter in a vessel, whereby the aluminum is extracted alone and separated from the composition through the filter.

3,721,547

METHOD OF FLUXING AND FLUIDIZING SLAG IN A CUPOLA

Joseph E. Dvorak, South Euclid, and John F. Wallace, Shaker Heights, both of Ohio, assignors to Cleveland Flux Company, Cleveland, Ohio

Filed Sept. 15, 1971, Ser. No. 180,928

Int. Cl. C21b *3/02*; C21c *1/02*

U.S. Cl. 75—30 **4 Claims**

A method of fluxing and fluidizing the slag in a cupola by adding to the charge therein a fluxing material comprising, by weight, from 30 to 60% CaO, as limestone; from 5 to 25% Al_2O_3 (alumina); from 20 to 50% Na_2O; and from 0 to 1% SiO_2. For basic and neutral operating cupolas, the flux will be used in amounts ranging from about 0.25 to 2.5% by weight, based upon the metal charge. Acid operations require somewhat less (about 0.15 to 2.0% of the metal charge). The flux serves to improve the fluidity of the slag, lower oxidation losses, remove sulfur and improve carbon pick-up of the metal without emitting gases harmful to the atmosphere.

3,721,548

TREATMENT OF IRON-CONTAINING PARTICLES

Abram L. Hodge, Cranford, N.J., and Michael P. Fedock, Cleveland, Ohio, assignors to Republic Steel Corporation, Cleveland, Ohio

Filed Dec. 23, 1968, Ser. No. 786,100
Int. Cl. C21b 3/04, 1/00, 1/08
U.S. Cl. 75—25 14 Claims

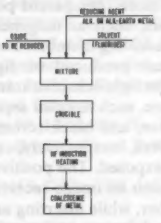
Iron-containing particles such as fume in steel furnace gases are removed by exposing the gas to lime at selected high temperature and under controlled conditions, e.g. of CO and CO_2 content in the gas, such that the particles are essentially FeO, whereby a rapid absorption results, with substantial penetration of the lime pieces by iron oxide, at least in part producing a compound identified as dicalcium ferrite. Complete operation involves continuously calcining limestone and advancing the calcined lime lumps through a reaction zone while the fume-laden gas passes countercurrently through the solids, heat being supplied for the incoming gas and for the limestone calcination as needed. An iron-containing lime product results, preferably in discrete, non-clinkered pieces, having good physical properties and special advantages of reactive availability when used as lime feed in iron and steelmaking operations, accompanied by efficient recovery and use of iron values.

3,721,549

PREPARATION OF METAL INGOTS FROM THE CORRESPONDING METAL OXIDES

Jean-Jacques Gallay, deceased, late of Talant, France, by Marielle Gallay, administratrix, Talant, Jean-Louis Helary, Nantes, and Marcel Jurien-de-la-Graviere, Fontaine-les-Dijon, France; said Helary and said Jurien-de-la-Graviere assignors to Commissariat a l'Energie Atomique, Paris, France

Filed July 7, 1970, Ser. No. 52,829
Claims priority, application France, July 11, 1969, 6923886
Int. Cl. C22b 53/00
U.S. Cl. 75—84.1 13 Claims



Metals such as U, Pu, Ti, Zr in the massive state are prepared from their oxides by heating a mixture in a non-oxidizing atmosphere by direct induction of HF electric currents, said mixture comprising the oxide, an alkali-earth reducing metal (Ca or Mg) and the fluoride of the reducing metal, either alone or mixed with calcium fluoride. Induction heating is maintained beyond start-up of the reaction metal until coalescence of the metal.

3,721,550

PROCESS FOR PRODUCING A HETEROGENOUS PENETRATION-BONDED METAL

Horst Schreiner, Nurnberg, and Heinrich Hassler, Wendelstein, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed March 25, 1971, Ser. No. 128,059
Claims priority, application Germany, March 26, 1970, P 20 14 639.8
Int. Cl. B22f 3/26, 7/02
U.S. Cl. 75—208 R 4 Claims

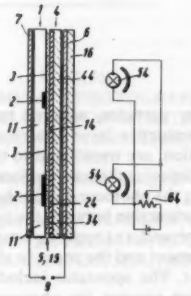
The invention relates to a method of producing a heterogenous, penetration-bonded metal for use as a contact material for vacuum switches. The pores of a pore containing sintered structure comprising a burn-off resistant, high melting metal such as tungsten, rhenium or molybdenum, are filled with a lower melting metal of good electrical conductivity, such as silver, copper, or a lower melting alloy of these metals. A structure or skeleton of the high melting metal is first sintered. This is then saturated or impregnated with the lower melting metal or alloy. Subsequently, at least one metal, with a high vapor pressure is installed as an alloy component, by means of diffusion, into the lower melting impregnation metal which is contained in the pores of the high melting metal structure. The diffusion metal is located in an auxiliary metal and the diffusion temperature is below the melting temperature of the impregnation metal.

3,721,551

METHOD OF PRODUCING ELECTROGRAPHIC IMAGE FROM ORIGINAL PROVIDED WITH A CONDUCTIVITY PATTERN

Costantino Marcus Cantarano, 49, avenue Franklin Roosevelt, Thiais, France

Continuation-in-part of Ser. No. 631,792, April 8, 1967, abandoned. This application Dec. 8, 1969, Ser. No. 870,404
Int. Cl. G03g 17/00
U.S. Cl. 96—1 R 10 Claims



The invention provides an electrographic image by generating between a first and second electrode an electric field across a developer powder sandwiched between an original having a conductivity pattern of maximum and minimum conductivities and an image carrier of uniform conductivity intermediate the maximum and minimum conductivities of said pattern.

3,721,552

ELECTROPHOTOGRAPHIC REPRODUCTION MATERIAL

Jacques C. T. Tellier, Conklin, N.Y., and Henri G. J. deBoer, Delft, Netherlands, assignors to GAF Corporation, New York, N.Y.

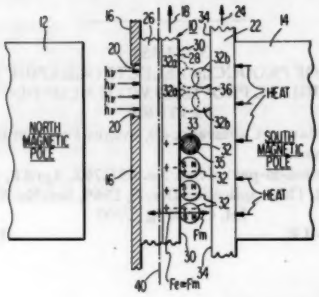
Continuation of Ser. No. 723,590, April 23, 1968, abandoned. This application July 22, 1971, Ser. No. 165,408
Int. Cl. G03g 5/06
U.S. Cl. 96—1.5 15 Claims

Photoconductive compositions containing a resin and as a photoconductor, a 2-tricyanovinyl-pyrrol, a 3-tricyanovinylindole or a tricyano-vinyl-benzene which may have an amino or hydroxy group in 4-position, optionally including an optical sensitizer, and electrophotographic reproduction materials having a layer of said composition adhering to a substrate.

3,721,553
METHOD OF TRANSFERRING MAGNETIC TONER PARTICLES IN AN IMAGE CONFIGURATION AND APPARATUS THEREFOR

Edward Charles Giaimo, Jr., Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed April 16, 1971, Ser. No. 134,770
Int. Cl. G03g 13/14
U.S. Cl. 96—1.4 10 Claims



Magnetic toner particles, adhered to an electrostatically charged photoconductive layer of a recording element in an image configuration, are transferred to the surface of a sheet of paper by (a) disposing the paper adjacent to the toner particles, (b) exposing the photoconductive layer to light to reduce the electrostatic attraction between the toner particles and the recording element; and, (c) applying a magnetic field between the recording element and the paper to attract the toner particles to the paper. The apparatus includes a transfer station where a light pipe exposes the photoconductive layer with light and a heater fixes the toner particles to the paper.

3,721,554
ORGANIC PHOTOCONDUCTIVE MATERIALS FORMED BY CONDENSING PHOTOCONDUCTIVE AND DYESTUFF REACTANTS

Shinichiro Nagashima, and Kaichi Tsuchiya, both of Tokyo, Japan, assignors to Canon Inc., Tokyo, Japan
Canon Inc., Tokyo, Japan

Filed Dec. 29, 1969, Ser. No. 888,886
Int. Cl. G03g 5/04
U.S. Cl. 96—1.5 3 Claims

A light-transparent photoconductive material for use in electrophotography is the reaction product obtained by condensing

a. an organic photoconductive compound containing an amino and/or hydroxyl group and

b. a reactive colored compound containing an active halogen atom;

or by condensing

a. an organic photoconductive compound containing an active halogen atom and

b. a reactive colored compound containing an amino and/or hydroxyl group.

3,721,555
DIFFUSION TRANSFER RECEPTION ELEMENTS, FILM UNITS AND PROCESSES THEREFOR

Richard W. Becker, and Glen M. Dappen, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 24, 1971, Ser. No. 174,505
Int. Cl. G03c 7/00, 5/54, 1/40
U.S. Cl. 96—29 D 22 Claims

Vinyl polymers containing anionic solubilizing groups are employed as the binder in a light-reflective layer which is associated with a dye image-receiving layer employed in color diffusion transfer systems.

3,721,556
DIFFUSION TRANSFER RECEPTION ELEMENTS, FILM UNITS AND PROCESSES THEREFOR

Delbert D. Fix, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 24, 1971, Ser. No. 174,506
Int. Cl. G03c 7/00, 5/54, 5/48
U.S. Cl. 96—3 30 Claims

A dye image-receiving element comprising a light-reflecting layer underneath a dye image-receiving layer, each of the layers containing a basic polymeric mordant, is useful in color development diffusion transfer systems utilizing immobile couplers which form diffusible dyes.

3,721,557
METHOD FOR TRANSFERRING COLORED IMAGE AND LIGHT-SENSITIVE TRANSFER SHEETS THEREFOR

Nobuyuki Inoue, Kawagoe City, Japan, assignor to Process Shizai Company Limited, Tokyo, Japan

Filed March 6, 1969, Ser. No. 804,908
Claims priority, application Japan, Aug. 14, 1968, 43/57367
Int. Cl. G03c 5/54
U.S. Cl. 96—28 16 Claims

A method of preparing a mono-color or multicolor image by transferring one or more transparent positive images of different primary colors, such as magenta, yellow, cyan, and black on an image-receiving member. Positive colored images of primary colors are produced on light-sensitive transfer sheets by exposing the light-sensitive transfer sheets to actinic light through a picture, such as color separation films, such as magenta, yellow, cyan, and black screened color separation negatives or positives, respectively, and developing the transfer sheets thus exposed. The positive colored images are transferred in turn onto an image-receiving member in registration with each other, while inserting an adhesive layer with each positive colored image and receiving surface of the image-receiving member. A light-sensitive transfer sheet usable for preparing the color-proofing sheet, which comprises a support, a stripping film laminated on the support, and a photosensitive layer overlaid on the stripping film and mainly consisting of photopolymer. After exposure and development, each colored image formed on the light-sensitive transfer sheet is transferred onto an image-receiving member by inserting an adhesive layer therebetween.

3,721,558
MORDANT VEHICLE FOR COLOR IMAGE TRANSFER RECEIVERS

Thomas I. Abbott, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 24, 1971, Ser. No. 174,545
Int. Cl. G03c 5/54, 5/58
U.S. Cl. 96—29 D 23 Claims

The use of a hydrophobic, alkali-permeable polymer as a binder for a dye mordant in a dye image-receiving layer employed in color diffusion transfer systems results in less stain than conventional gelatin vehicles.

3,721,559

PHOTOGRAPHIC MATERIAL FOR THE PREPARATION OF PRINTING PLATES

Louis Maria De Haes; Hugo Karel Gevers, both of Edegem, and Johannes Josephus Vanheertum, Halle-Zandhoven, all of Belgium, assignors to Agfa Gevaert N.V., Mortsel, Belgium

Continuation of Ser. No. 738,097, June 19, 1968, abandoned. This application Aug. 23, 1971, Ser. No. 174,140

Claims priority, application Great Britain, June 19, 1967, 28,237/67; April 26, 1968, 19,887/68

Int. Cl. G03f 7/02

U.S. Cl. 96—33 12 Claims

A planographic printing plate is prepared from a photographic sheet material comprising a support, a light-sensitive silver halide emulsion layer and an exterior hydrophilic colloid stratum having at its free surface a pattern of finely divided silver particles, by contacting the same with an aqueous alkaline fixer composition containing an oxidizing agent for metallic silver and an organic thione, or mercapto tautomer thereof, for converting the pattern of silver particles into a hydrophobic ink-receptive pattern, the colloid stratum being hardened before the material is used for printing and preferably before or at least concurrently with its contact with said fixer composition, the extent of the hardening being at least that necessary to prevent removal of the colloid material during printing. The pattern of silver particles is produced by means of the silver complex diffusion transfer process in which insoluble development nuclei are applied to the free layer surface either from the diffusion transfer developing liquid or a separate liquid applied prior to the developing liquid. Preferably the colloid stratum is hardened by means of a latent hardener released during the course of the diffusion transfer process. The colloid stratum can be an external stratum of the emulsion layer or a separate colloid layer applied to the emulsion layer.

3,721,560

PHOTOTHERMOGRAPHIC MATERIAL CONTAINING A PHOTOSENSITIVE METAL OXIDE SEMICONDUCTOR OR BENZOPHENONE AND A FREE METAL GENERATING ALKANOLAMINE

Frans Clement Heugebaert, Kontich, and Eric Maria Brinckman, Mortsel, both of Belgium, assignors to Agfa-Gevaert N.V., Mortsel, Belgium

Filed May 10, 1971, Ser. No. 142,044

Claims priority, application Great Britain, May 11, 1970, 22,682/70

Int. Cl. G03c 1/00, 5/32

U.S. Cl. 96—48 HD 8 Claims

A photosensitive recording material comprising a metal-containing amino-alcohol reaction product yielding free metal on heating and in inter-reactive relationship with said product a photosensitive substance, which in photo-exposed state lowers the decomposition temperature of said product.

The preferred reaction product is a reaction product of yellow lead(II)oxide and tri-isopropanolamine. Preferred photosensitive substances are photoconductive lead(II)oxide, zinc oxide and titanium(IV)oxide.

3,721,561

DYE IMBIBITION IMAGING

Rexford W. Jones and William B. Thompson, Columbus, Ohio, assignors to A. E. Staley Manufacturing Company, Decatur, Ill.

No Drawing. Continuation-in-part of abandoned application Ser. No. 796,897, Feb. 5, 1969. This application Mar. 10, 1971, Ser. No. 123,084

Int. Cl. B05c 1/16; G03c 5/24

U.S. Cl. 96—48 24 Claims

Process of forming dye-imbibition images wherein powder particles comprising a dye, held in image-wise configuration in particulate form in or on a substrate, is contacted with vapors of a material, which is a solvent for said dye and capable of swelling the surface of said substrate, molecularly imibibing said dye into said substrate. Line, continuous-tone or half-tone images are preferably produced by exposing to actinic radiation in image-receiving manner a substrate bearing a positive-acting or negative-acting light-sensitive organic layer having a thickness of at least 0.1 micron, said layer being capable of developing a R_d of 0.2 to 2.2, continuing the exposure to either clear the background of positive-acting light-sensitive layers or to establish a potential R_d of 0.2 to 2.2 with negative-acting light-sensitive organic layers; applying to said layer of organic material, free flowing powder particles having a diameter, along at least one axis of at least 0.3 micron but less than 25 times the thickness of said organic layer wheren said powder particles comprise a solid carrier and dye; while the layer is at a temperature below the melting points of the powder and of the organic layer, physically embedding said powder particles as a monolayer in a stratum at the surface of said light-sensitive layer to yield images having portions varying in density in proportion to the light exposure of each portion, removing non-embedded particles from said organic layer to develop an image; and molecularly imbibing dye into the substrate (including subbing layer on said substrate) by contacting the particles embedded in said organic layer with vapors of a material which is a solvent for said dye and capable of swelling said substrate.

3,721,562

INTEGRAL LAMINATE PHOTOGRAPHIC UNITS COMPRISING DEVELOPING COMPOSITION-SPREADER SHEETS CONTAINING A POLYMERIC ACIDIFYING LAYER

Edwin H. Land, Cambridge, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 888,919, Dec. 29, 1969. Filed July 29, 1971, Ser. No. 167,455

Int. Cl. G03c 5/38, 5/54, 7/00

U.S. Cl. 96—61 M 22 Claims

Novel system for forming visible images wherein an aqueous alkaline processing composition is applied between a first sheet comprising a photosensitive element and a second sheet including an acid-neutralizing layer, said sheets being adapted for being maintained together after application of the processing composition. In a preferred embodiment, a system is disclosed for forming negative images wherein a developed and fixed negative image in silver is provided with a transparent overlay through which the image may be viewed. In another disclosed embodiment, an image in color, which may be a positive transfer image, is provided with such a transparent overlay.

3,721,563

PHOTOGRAPHIC DEVELOPER CONCENTRATE

Richard S. Fisch; Norman Newman, and Joel L. Bexell, all of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Co., St. Paul, Minn.

Filed Sept. 24, 1971, Ser. No. 183,674

Int. Cl. G03c 5/30, 7/00

U.S. Cl. 96—66.1 8 Claims

A phase-stable acidic photographic color developing solution which includes, in aqueous solution, a p-phenylenediamine developing agent and ascorbic acid.

3,721,564

GELATINO SILVER HALIDE EMULSION CONTAINING A HALOGENATED ALDEHYDE ACID AND A PERHYDROTRIAZINE COMPOUND AS HARDENING AGENTS

Raphael Joris Velter, Mortsel, Belgium, and Karl-Otto Meyer, Leverkusen, Germany, assignors to Gevaert-Agfa N.V., Mortsel, Belgium

Filed Feb. 16, 1970, Ser. No. 11,789

Claims priority, application Great Britain, Feb. 24, 1969, 9,811/69

Int. Cl. G03c *1/30*

U.S. Cl. 96—111 7 Claims

A photographic silver halide emulsion element comprising a gelatin layer including therein as a combination of hardening agents, a hexahydro-1,3,5-triazine carrying at least two N-vinylcarbonyl or N-vinylsulphonyl groups, mucochloric or mucubromic acid is described. The hardening of the gelatin layer is rapid without loss of permeability to processing solutions and with no after-hardening occurring.

3,721,565

POLYMERIC BINDERS FOR PHOTOGRAPHIC EMULSIONS

Maurice J. Fitzgerald, Canton, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed July 6, 1971, Ser. No. 160,214

Int. Cl. G03c *1/04*

U.S. Cl. 96—114 23 Claims

A photosensitive silver halide emulsion wherein the emulsion binder comprises a graft copolymer of an amine diamide monomer on a polymer containing a plurality of hydroxyl groups.

3,721,566

INCREASING THE LIGHT SENSITIVITY OF POLYMERIC COMPOSITIONS COMPRISING AZIDO GROUPS

Urbain Leopold Laridon, Wilrijk; Gerard Albert Delzenne, S-Gravenwezel, and Hugo Karel Peeters, Mortsel, all of Belgium, assignors to Gevaert-AGFA N.V., Mortsel, Belgium

Filed July 6, 1970, Ser. No. 52,690

Claims priority, application Great Britain, Dec. 23, 1969, 62,709/69

Int. Cl. G03c *1/70*

U.S. Cl. 96—115 R 5 Claims

The light-sensitivity of polymeric compositions comprising azido groups is increased by intimately mixing them with sensitizing agents taken from imidazoles, oxazoles, oxadiazoles, thiazoles, polynuclear aromatic hydrocarbons and polynuclear quinones.

The polymeric compositions may be composed of a mixture of a polymer comprising reactive groups with a compound or polymer containing at least two arylazide or sulphonyl azide groups. These aryl azide or sulphonyl azide groups may also be attached as substituents to the polymers containing reactive groups occasionally via a sensitizing group, or the polymer may be mixed with a compound wherein at least two azido groups are linked by means of a sensitizing group.

Production of photographic printing plates and etching resists.

3,721,567

PRODUCTION OF LIVERSTOCK FEED FROM SUGARCANE

Robert Boothe Miller, Montreal, Canada, and C. Keith Laurie, Bridgeport, Barbados, assignors to Canadian Cane Equipment Ltd., Montreal, Quebec, Canada

Filed April 8, 1970, Ser. No. 26,598

Int. Cl. A23k *1/18, 1/22*

U.S. Cl. 99—2 ND 4 Claims

A process for sustaining livestock, e.g., ruminants such as cattle, is described which involves providing the livestock with a feed comprising sugarcane pith which contains a substantial amount of the naturally present sugar juice and which is substantially free from the highly lignified outer rind fibers of the sugarcane. This feed may also contain nitrogenous protein substituents such as urea, a leguminous meal, and various minerals. The sugarcane pith may be obtained by longitudinally opening sugarcane without expressing a significant amount of the sugar juice from the pith, and then separating the pith from the outer rind fibers while retaining substantially all of the sugar juice in the pith.

3,721,568

METHOD OF TREATING SPENT GRAIN

Jack P. Wilson, Wynnewood, Pa., assignor to Proctor & Schwartz, Inc., Philadelphia, Pa.

No Drawing. Filed July 14, 1970, Ser. No. 56,217

Int. Cl. A23l *1/10*

U.S. Cl. 99—80 B 7 Claims

The spent grain coming from a still is spray dried in a conventional spray dryer to arrive at a dried grain product fit for human consumption or substantially mitigate the problems of pollution caused by spent grain constituents.

3,721,569

METHOD FOR DEFATTING SOYBEAN MEAL

Keith H. Steinkraus, Geneva, N.Y., assignor to Cornell Research Foundation, Inc., Ithaca, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 687,479, Dec. 4, 1967. This application Mar. 1, 1971, Ser. No. 119,846

Int. Cl. A23l *1/20*

U.S. Cl. 99—98 2 Claims

Organoleptically bland soybean meal is prepared by extracting ground, unheated, unpressed soybeans with concentrated ethyl alcohol followed by a mixture of concentrated ethyl alcohol and chloroform. The meal, in addition to being completely defatted and debittered, is free of undesirable mouth-coating factor.

3,721,570

MILK-FREE MARGARINE

Lino L. Linteris, Demarest, N.J., assignor to Lever Brothers Company, New York, N.Y.

Filed July 20, 1971, Ser. No. 164,454
Int. Cl. A23d 3/02
U.S. Cl. 99—123 5 Claims

Milk-free margarines, unlike margarines having milk solids in the aqueous phase, have little tendency to discolor when used for frying but have the undesirable attribute of a reduced salt sensation, and the reduction is counteracted by the presence of very small amounts of sodium caseinate.

3,721,571

PUDDING COMPOSITIONS

Martin Glicksman, 229 Valley Road, Valley Cottage, N.Y. 10989, and Elizabeth H. Farkas, 377 N. Broadway, Yonkers, N.Y. 10701

No Drawing. Filed Jan. 14, 1971, Ser. No. 106,583
Int. Cl. A23l 1/14, 1/04
U.S. Cl. 99—139 4 Claims

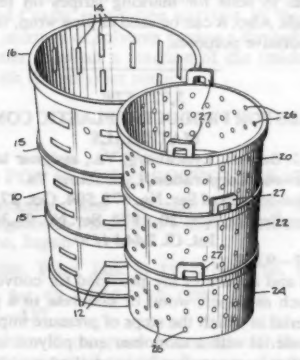
Room-temperature setting dessert compositions which exhibit good resistance to syneresis, even under conditions of high temperature heat treatment or freeze-thaw, are prepared from non-chemically modified starch and xanthan gum either alone or in combination with locust bean gum and/or tara gum.

3,721,572

PRESERVATION OF OLIVES

Victor N. Cory, 465 W. 23rd St., New York, N.Y. 10011

Filed July 30, 1970, Ser. No. 59,657
Int. Cl. A23b 7/02, 7/04
U.S. Cl. 99—197 13 Claims



Processes for preserving foods which comprise subjecting a brine food, such as olives, to a gaseous medium having a temperature of from about 160° F. to about 180° F. to evaporate the free surface moisture on the food, chilling the dried food to a temperature of from about 26° F. to about 33° F. with a blast of a gaseous medium having a temperature of from about 20° F. to about 30° F., and maintaining the chilled food at a temperature of from 26° F. to 35° F. by circulation of a gaseous medium over the food; as well as products obtained thereby.

3,721,573

PEELING CITRUS FRUIT

Lyle J. Martinsen, Murray, Utah, assignor to Practical Innovations, Inc., Murray, Utah

Division of Ser. No. 9,804, Feb. 9, 1970, Pat. No. 3,674,503.
This application April 27, 1972, Ser. No. 248,359
Int. Cl. A23l 1/00; A47j 17/04
U.S. Cl. 99—233.12 14 Claims

Peelers for cutting and peeling citrus fruit and the like and related methods. Each peeler is formed in one piece and has a holding flange adapted to be gripped between the fingers of the user, a cutting portion having a cutting edge, and a depth gauge flange which regulates the depth of the cut made by the cutting edge. The holding flange and the depth gauge flange are joined to one another by a weakened or structurally less resistant bend line so that in one position the two flanges are linearly continuous with the cutting edge being closely juxtaposed the opposed flanges whereby the user of the citrus fruit is not inadvertently cut, and in another position the two flanges are angular with respect to each other, the cutting edge being situated in an exposed cutting position. Each peeler may be conveniently releasably attached, as by bonding, to the citrus fruit so that the peeler and citrus fruit may be conveniently shipped, stored or carried by a person. The configuration of each peeler is adapted to match the exterior configuration of the fruit so as to be flush therewith when attached thereto.

3,721,574

SILICATE COATINGS COMPOSITIONS

Robert H. Schneider, 3639 Grennoch, Houston, Tex., and John B. Schutt, 2403 Peach Stone Ct., Silver Spring, Md.

Filed Aug. 6, 1968, Ser. No. 750,461
Int. Cl. C09d 1/04
U.S. Cl. 106—74 10 Claims

Water resistant and air-drying alkali metal silicate coatings contain a base of an alkali metal silicate solution having a high molar ratio of solvated silica to alkali metal oxide. To this base is added colloidal silica in amounts to increase the SiO_2:alkali metal oxide mole ratio to as high as 9:1. The compositions are advantageously modified with silane wetting agents and multivalent metal ions, e.g., calcium. Ultimately, the coatings may be modified with various materials such as tetrafluoroethylene polymer or zinc.

3,721,575

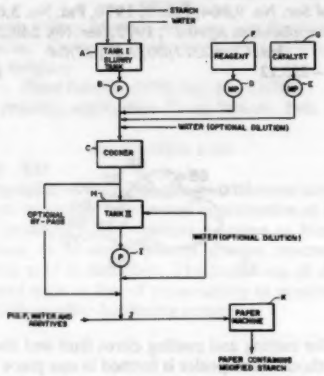
CONTINUOUS PROCESS FOR THE PREPARATION OF MODIFIED STARCH DISPERSIONS

Wadym Jarowenko, Plainfield, N.J., assignor to National Starch and Chemical Corporation, New York, N.Y.

Filed Jan. 5, 1971, Ser. No. 103,989
Int. Cl. C08b 25/02
U.S. Cl. 106—213 7 Claims

A process for preparing dispersions of modified starches containing cationic groups which comprises continuously and simultaneously gelatinizing and reacting a starch with a monofunctional cationogenic reagent in an aqueous reaction medium having a pH of 8 or higher at a tem-

perature of at least 100° C. The derivatized starch products are conveniently utilized at the site of their preparation as, for example, wherein the products are added directly to the furnish or pulp during paper manufacture.



3,721,576

MARK FORMING RECORD MATERIALS AND PROCESS FOR THEIR USE

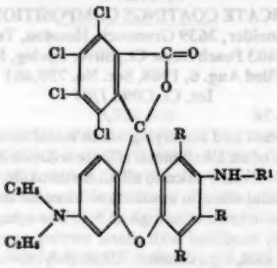
Sheldon Farber and Arthur John Wright, Dayton, Ohio, assignors to The National Cash Register Company, Dayton, Ohio

No Drawing. Original application Nov. 3, 1970, Ser. No. 86,642, now Patent No. 3,642,827. Divided and this application Oct. 1, 1971, Ser. No. 185,828

Int. Cl. B41m *5/22*

U.S. Cl. 117—36.2 **13 Claims**

A pressure-sensitive record unit and a mark-forming unit are disclosed which employ a chromogenic material of normally colorless form having the structural formula:



wherein R is hydrogen, an alkyl radical having 1 to 4 carbon atoms per R group or chlorine and R^1 is hydrogen, an alkyl radical having 1 to 4 carbon atoms per R^1 group or phenyl.

3,721,577

PROCESS FOR THE DEPOSITION OF REFRACTORY METAL AND METALLOID CARBIDES ON A BASE MATERIAL

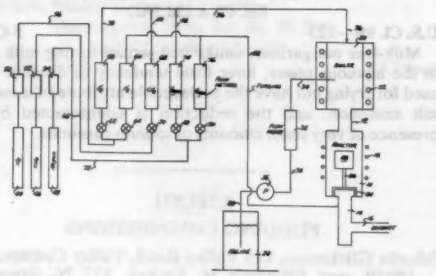
Paul F. Woerner, Grosse Pointe, Mich., assignor to Teeg Research, Inc., Detroit, Mich.

Continuation-in-part of application Ser. No. 581,646, Sept. 23, 1966, now Patent No. 3,529,988. This application Aug. 26, 1968, Ser. No. 755,242

Int. Cl. B44d *1/00;* **C23c** *11/08*

U.S. Cl. 117—46 CG **10 Claims**

A process for the deposition of refractory metal or metalloid carbides on ferrous and non-ferrous base materials by heat reacting a hydrocarbon and halide vapors of the metal or metalloid to be deposited in a hydrogen atmosphere, the hydrocarbon concentration being at least .5% per volume and the temperature of reaction being at least 1050° C.



3,721,578

PLASTICIZED SULFUR, BITUMINOUS OR ASPHALT IMPREGNATED FABRIC

Richard J. Bennett, and Rector P. Louthan, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 720,368, April 10, 1968, Pat. No. 3,619,258. This application Sept. 24, 1970, Ser. No. 75,262

Int. Cl. D06n *7/00;* **B32b** *11/00*

U.S. Cl. 117—92 **2 Claims**

A fabric is asphalt or bitumen coated and then adhesively coated at least on one side with plasticized sulfur. Bitumens including asphalt and asphalt emulsions now available are applicable. Hot melt application which can be followed immediately by the plasticized sulfur is possible. The product, which is flexible, solvent, weather resistant and light reflecting, and can be used for water-proofing as in roofing, road liners, pond and ditch liners, as wrapping material, it can be packaged as in rolls for marking stripes on tennis courts, athletic fields. Also, it can be used as pipe wrap, tank cladding and for decorative purposes.

3,721,579

METHODS FOR PRODUCING PLASTIC COMPOSITE MATERIALS

Lawrence G. Barrett, Lynchburg, Va., assignor to The American Novawood Corporation, Lynchburg, Va.

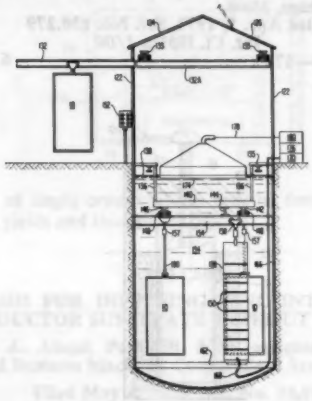
Continuation-in-part of Ser. No. 678,584, Oct. 27, 1967. This application Nov. 20, 1970, Ser. No. 91,381

Int. Cl. B44d *1/50*

U.S. Cl. 117—93.31 **10 Claims**

Methods and apparatus are provided for converting a base material such as paper, wood or concrete to a plastic composite material in which the steps of pressure impregnation of the base material with a monomer and polymerization of the monomer after impregnation by irradiation is accomplished in a single container. The apparatus includes an irradiation tank equipped with an irradiation absorbing fluid recirculation system for bacteria control and an inert gas system for displacing the irradiation absorbing fluid from between the submerged containers and the irradiation source. The methods described include placing a first canister containing composite material impregnated with a liquid monomer within radiation receiving proximity to the radiation source, irradiating through walls of the canister the impregnated material in the canister by an amount sufficient to effect partial polymerization of the monomer without raising the temperature to a disadvantageous level, and after partial polymerization of the monomer in the first canister, placing a second canister con-

taining the material impregnated with a liquid monomer between the first canister and the radiation source whereby substantially only radiation passing through the second



canister effects complete polymerization of the monomer in the first canister without further materially raising the temperature of the composite material therein.

3,721,580

SURFACE TREATMENT POLYMER STRUCTURES

Gene F. Trott, Clarksville, Ind., and Joseph M. Starita, Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

No Drawing. Filed Mar. 31, 1971, Ser. No. 129,951

Int. Cl. B32b *27/06, 27/16;* B44d *5/12*

U.S. Cl. 117—118 13 Claims

The surface characteristics of parts composed of or containing an aromatic carbocyclic polymer are improved by contacting the surface with an imido-alkylene compound and a Friedel-Crafts' alkylation catalyst in the presence of a selected mixture of solvents having a limited solubility for the polymer to effect a reaction of the imido-alkylene compound with the polymer surface.

3,721,581

PROCESS FOR FLAMEPROOFING TREATMENT

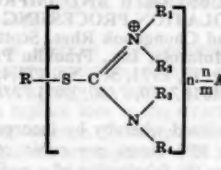
Kazuhiro Teramura and Terukazu Ishizuka, Kyoto-shi, Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

No Drawing. Filed Jan. 6, 1971, Ser. No. 104,463

Int. Cl. C09d *5/18;* C09k *3/28*

U.S. Cl. 117—137 3 Claims

A process for flameproof treatment of fibers, films, sheets, boards and other articles by use of a compound having the general formula:



wherein R represents a non-substituted or substituted hydrocarbon group or a heterocyclic group; and R_1, R_2, R_3, and R_4, respectively, represent hydrogen atoms or non-substituted or substituted hydrocarbons or a component of a heterocyclic group formed from two components selected from R_1, R_2, R_3, and R_4 and A represents an inorganic or an organic anion, and *n* represents an integer of 1–6 and *m* represents the valency of A.

3,721,582

DRY, CARDABLE, SELF-BONDABLE FIBERS OF REGENERATED CYANOETHYL CELLULOSE

Theodore S. Matter, Upper Darby, and James E. McMaster, Secane, both of Pa., assignors to FMC Corporation, Philadelphia, Pa.

Filed Jan. 8, 1971, Ser. No. 105,101

Int. Cl. D06m *13/40*

U.S. Cl. 117—139.5 CQ 10 Claims

Dry, soft, cardable, self-bondable fibers of regenerated cyanoethyl cellulose having an average degree of substitution of from about 0.25 to about 0.65 which have been prepared by neutralizing wet-gel fibers of regenerated cyanoethyl cellulose while maintaining them in a substantially non-swollen condition in a concentrated aqueous salt solution, contacting the fibers with a lubricant for cellulosic fibers under non-swelling conditions, and then drying the fiber down to at least a normal moisture regain content.

3,721,583

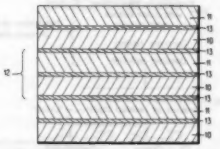
VAPOR PHASE EPITAXIAL DEPOSITION PROCESS FOR FORMING SUPERLATTICE STRUCTURE

A. Eugene Blakeslee, Mount Kisco, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 8, 1970, Ser. No. 96,206

Int. Cl. B44d *1/18*

U.S. Cl. 117—215 18 Claims



A vapor phase epitaxial process for forming a superlattice structure comprising alternate layers of different semiconductor materials on a substrate. In the superlattice, the proportion of one component is caused to periodically vary from a desired maximum to a desired minimum over an extremely small period. For an *n* component system, this is accomplished by forming a stream comprising $n-1$ components and injecting pulses of the *n*th component in a carrier gas separated by pulses of carrier gas into the $n-1$ component stream, to thereby provide at the substrate alternate, discrete bursts of gas comprising *n* components and $n-1$ components, respectively. By critically controlling diffusion of adjacent pulses and bursts, the proportion of the *n*th component in the superlattice structure can be varied from a maximum to a minimum within an extremely small period.

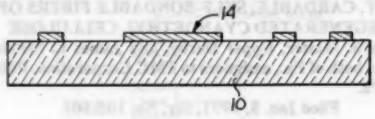
High temperature, vapor phase epitaxial deposition apparatus for depositing such a repetitive superlattice structure: basically a pulsing chamber to receive the $n-1$ component stream; pulsing means to periodically pulse the *n*th component into the $n-1$ component stream, whereby the bursts described above are formed; and deposition means containing a substrate to receive said bursts for the formation of said superlattice. All elements are correlated to permit diffusion to be critically controlled.

3,721,584

SILICON COATED SUBSTRATES AND OBJECTS FABRICATED THEREFROM

Albert R. Diem, 1181 Lake Street, Salt Lake City, Utah

Filed April 13, 1970, Ser. No. 27,744
Int. Cl. B44d *1/18*
U.S. Cl. 117—212 13 Claims



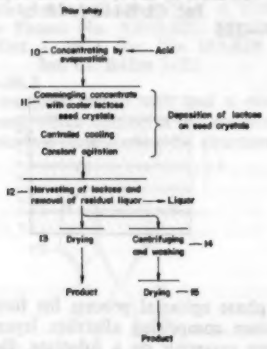
Silicon coated substrates for such uses as optical filters, photo masks, passive circuits and as an information storage means.

3,721,585

METHOD FOR MANUFACTURE OF LACTOSE

Leo H. Francis, Burlingame, and Henry L. Pollard, Millbrae, Calif., assignors to Foremost McKesson, Inc., San Francisco, Calif.

Continuation of abandoned application Ser. No. 840,129, June 27, 1969, which is a continuation-in-part of application Ser. No. 477,852, Aug. 6, 1965. This application Jan. 28, 1971, Ser. No. 110,743
Int. Cl. C13k *5/00*
U.S. Cl. 127—60 4 Claims



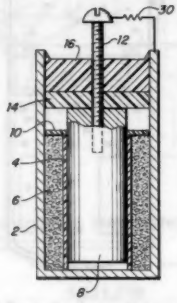
Process for removing lactose from whey in which a crystallizing cycle is commenced by introducing a quantity of whey concentrate at an elevated temperature into the lower end of a crystallizing tank. The tank contains a seed bed comprising a quantity of liquor and lactose seed crystals left from a preceding cycle, whereby the incoming concentrate flows upwardly through the seed bed. Crystallization of lactose from solution commences by deposition of lactose on the seed crystals. After the batch of concentrate has been introduced, crystallization is continued until the end of the cycle during which time the mass of material in the tank is subjected to cooling. At the end of the cycle a quantity of material is withdrawn from the upper portion of the tank and lactose crystals removed from the same. The material remaining in the tank forms a seed bed for the next cycle. The material in the tank is continuously agitated throughout introduction of the concentrate, during the subsequent part of the crystallizing cycle and during withdrawal of material from the tank at the end of the crystallizing cycle.

3,721,586

METHOD OF REMOVING WATER FROM LITHIUM BATTERIES

Raymond J. Jasinski, Boston, and Lewis H. Gaines, Framingham, Mass., assignors to Tyco Laboratories, Inc., Waltham, Mass.

Filed Apr. 1, 1971, Ser. No. 130,279
Int. Cl. H01m *1/00*
U.S. Cl. 136—175 6 Claims



An improvement in the manufacture of lithium batteries, the improvement comprising electrolytically converting trace water to hydrogen gas and venting said gas before the batteries are sealed.

3,721,587

LOW CARBON, NIOBIUM AND ALUMINUM CONTAINING STEEL SHEETS AND PLATES AND PROCESS

Alfred G. Allten, Rosemont, and Frederick J. Semel, Philadelphia, Pa., assignors to Alan Wood Steel Company, Conshohocken, Pa.

No Drawing. Continuation-in-part of application Ser. No. 749,273, Aug. 1, 1968. This application Dec. 2, 1970, Ser. No. 94,618
Int. Cl. C22c *39/54*; C21d *7/13*
U.S. Cl. 148—36 14 Claims

An improved mild carbon steel which exhibits an unusual combination of properties including satisfactory high yield strengths, good toughness and weldability, and superior cold formability in the hot rolled condition. The steel, which is characterized by microstructures which are virtually free of elongated silicate inclusions, has the following composition by weight:

Carbon: 0.02 to 0.08%
Manganese: 0.25 to 0.80%
Silicon: 0.05% maximum
Niobium: 0.025 to 0.10% preferably 0.025 to 0.045%
Aluminum: 0.005 to 0.025%, preferably 0.008 to 0.018%
Iron and impurities, balance.

3,721,588

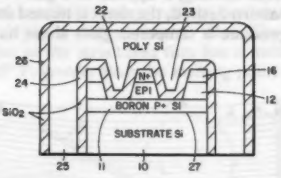
THIN SINGLE CRYSTAL SILICON ON AN INSULATING SUBSTRATE AND IMPROVED DIELECTRIC ISOLATION PROCESSING METHOD

Robert G. Hays and Chongkook Rhee, Scottsdale, Ariz., assignors to Motorola, Inc., Franklin Park, Ill.

Filed Aug. 13, 1971, Ser. No. 171,453
Int. Cl. H01l *7/50, 7/00*; B01j *17/00*
U.S. Cl. 148—175 13 Claims

A method is disclosed whereby by incorporating a P^+ boron layer of 5×10^{19} atoms per cubic centimeter or greater added during the fabrication of a wafer acts as an etch stop for a potassium hydroxide anisotropic etch solution (KOH). Thereby thin controlled layers of single

crystal silicon on an insulating substrate can be made. Similarly using the same etch stop dielectrically isolated



islands of single crystal silicon may be formed with improved yields and thickness control.

3,721,589

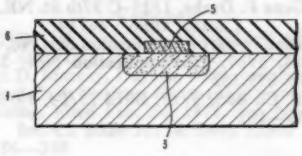
METHOD FOR DIFFUSING ZINC INTO A SEMICONDUCTOR SUBSTRATE WITHOUT WINGING

Joseph A. Aboaf, Peekskill, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 4, 1970, Ser. No. 34,914

Int. Cl. H01l 7/36

U.S. Cl. 148—188 **15 Claims**



A method of diffusing zinc into gallium arsenide without winging is disclosed. Zinc silicate is utilized as a diffusion source while silicon nitride and aluminum oxide are utilized to mask selected areas of a gallium arsenide substrate such that the diffused regions are precisely defined within the substrate. The use of these materials as diffusion source and mask prevent winging, i.e., lateral spreading of the diffusant at the interface between the mask material and the gallium arsenide substrate.

3,721,590

AMMONIUM PERCHLORATE WITH COCRYSTALLIZED OXALATE ANIONS

John Norman Maycock, Baltimore, Md., and Louis Witten, Cincinnati, Ohio, assignors to Martin Marietta Corporation, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 803,436, Feb. 28, 1969, which is a continuation-in-part of application Ser. No. 589,185, Oct. 19, 1966, both now abandoned. This application Nov. 20, 1969, Ser. No. 878,588

Int. Cl. C06b 11/00

U.S. Cl. 149—76 **2 Claims**

The rate of thermal decomposition of certain high energy solid state materials, such as explosives and propellant oxidizers, may be either increased or decreased by doping to replace ions in the structure with ions having a different valence. Decomposition rate is increased if univalent anions are replaced with multivalent anions, and rate is conversely decreased if univalent cations are replaced with multivalent cations that are less colored than the host material.

3,721,591

METHOD OF MAKING INFLATABLE BALLS

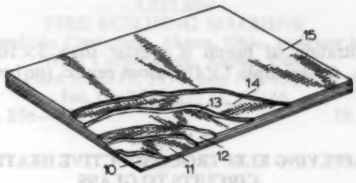
John Michael Crook, Luddendenfoot, near Halifax, England, assignor to Benjamin Crook & Sons Limited, Yorkshire, England

Filed Aug. 11, 1969, Ser. No. 848,783

Claims priority, application Great Britain, July 2, 1969, 33,485/69

Int. Cl. B32b 7/08

U.S. Cl. 156—93 **6 Claims**



In the production of an inflatable ball, a laminate is made of a plurality of fabric layers and a layer of plastics materials (which may be rubber or synthetic rubber). At least one of said fabric layers is impregnated with an uncured adhesive (which may be rubber). The layers are bonded together and then panels are cut from the laminate and stitched together to form the ball.

3,721,592

ETCHING METHOD EMPLOYING AN ETCHING MASK WHILE SUPPRESSING UNDERETCHING

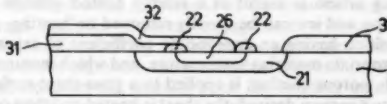
Reiner De Werdt, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 4, 1970, Ser. No. 34,489

Claims priority, application Netherlands, May 22, 1969, 6907831

Int. Cl. C23f 1/02

U.S. Cl. 156—11 **5 Claims**



The invention relates to etching with the aid of a mask while limiting underetching as much as possible by using an etchresistant and stable mask and by filling up after some time of etching, the cavities produced by underetching underneath the metal film with an etch-resistant resist by means of a photomechanical method.

3,721,593

ETCH STOP FOR KOH ANISOTROPIC ETCH

Robert G. Hays and Chongkook Rhee, Scottsdale, Ariz., assignors to Motorola, Inc., Franklin Park, Ill.

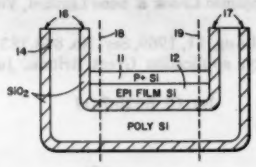
Filed Aug. 13, 1971, Ser. No. 171,455

Int. Cl. H01l 7/50

U.S. Cl. 156—17 **5 Claims**

The etch rate of boron doped silicon by a potassium hydroxide anisotropic etch solution varies with the doping level. Thus an etch stop for KOH anistropic etch for silicon is disclosed comprising a layer of silicon doped

with boron to a suface concentration level of about 5×10^{19} atoms of boron per cc. Preferably the surface



concentration of boron is greater than 5×10^{19} atoms per cc., for example 1×10^{20} atom per cc. for best results.

3,721,594

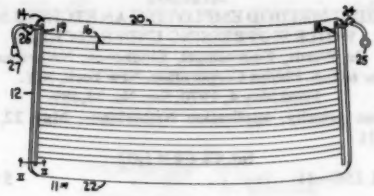
APPLYING ELECTROCONDUCTIVE HEATING CIRCUITS TO GLASS

Milton S. Tarnopol, Brackenridge, and Thomas P. Snyder, Pittsburgh, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 838,163, July 1, 1969, Pat. No. 3,671,311, which is a continuation-in-part of Ser. Nos. 737,907, June 18, 1968, abandoned, and Ser. No. 826,433, May 21, 1969, abandoned. This application July 20, 1971, Ser. No. 164,263

Int. Cl. B32b *17/10*

U.S. Cl. 156—89 **10 Claims**



Applying a decorative coating or design of electroconductive material to a glass base. When the base is transparent, the resulting article is useful as a readily heated window from which fog and ice can be readily removed on heating. A frit composition having an appropriate coefficient of expansion, an appropriate maturing temperature, and which matures into a rough, porous coating, is applied to a glass sheet surface in the circuit pattern desired, the sheet is heated and then cooled rapidly to produce a tempered glass sheet having a rough, porous frit coating conforming to the pattern desired for the electroconductive heating circuit, and a conductive metal coating is selectively deposited on the rough, porous frit by electroless plating. The frit may be sensitized by incorporating a minor amount of a sensitizing metal therein or by applying a sensitizing composition.

3,721,595

APPLYING ELECTROCONDUCTIVE HEATING CIRCUITS TO GLASS

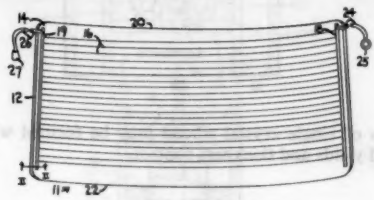
Milton S. Tarnopol, Brackenridge, and Thomas P. Snyder, Pittsburgh, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 838,163, July 1, 1969, Pat. No. 3,671,311, which is a continuation-in-part of Ser. Nos. 737,907, June 18, 1968, abandoned, and Ser. No. 826,433, May 21, 1969, abandoned. This application July 20, 1971, Ser. No. 164,262

Int. Cl. B32b *17/10*

U.S. Cl. 156—89 **10 Claims**

Applying a decorative coating of design of electroconductive material to a glass base. When the base is transparent, the resulting article is useful as a readily heated window from which fog and ice can be readily removed on heating. A frit composition having an appropriate coefficient of expansion, an appropriate maturing temperature, and which matures into a rough, porous coating, is applied to a glass sheet surface in the circuit pattern desired, the sheet is heated and then cooled rapidly to produce a tempered glass sheet having a rough,



porous frit coating conforming to the pattern desired for the electroconductive heating circuit, and a conductive metal coating is selectively deposited on the rough, porous frit by electroless plating. The frit may be sensitized by incorporating a minor amount of a sensitizing metal therein or by applying a sensitizing composition.

3,721,596

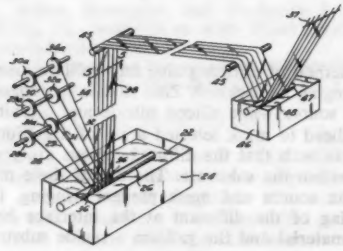
FLUID SEPARATION AND METHOD AND APPARATUS FOR FORMING SAME

Gene F. Drake, 1325–C 37th St. NE., Canton, Ohio 44714

Continuation-in-part of application Ser. No. 693,665, Dec. 26, 1967. This application Nov. 24, 1969, Ser. No. 879,132

Int. Cl. B05c *3/12;* **B01d** *13/04, 39/06*

U.S. Cl. 156—181 **2 Claims**



A method of forming a thin membrane is disclosed which has a substantially uniform thickness and is particularly useful for osmotic desalinization. An apertured film support member or assembly is immersed in a liquid casting solution and withdrawn therefrom so that a part of the liquid casting solution forms a homogeneous bridging film across the apertures provided by the film support member such that the thickness of the film is primarily determined by the fluid characteristics of the casting solution. The withdrawn portion of the film support member and the bridging film are suspended until the film sets to form a membrane which is substantially stable in nature.

3,721,597

BONDING METAL LAMINAE WITH THERMOPLASTIC FILM

Lyle W. Colburn, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

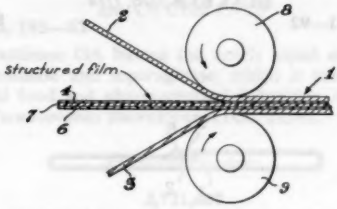
Filed May 2, 1969, Ser. No. 821,339

Int. Cl. C09j *5/06*

U.S. Cl. 156—309 **9 Claims**

A laminate of two metal laminae is produced by disposing between two metal laminae a structured film comprising an

inner layer of a thermoplastic material positioned between two layers of an adhesive thermoplastic material and applying heat and pressure to the metal laminae of sufficient magnitude to effect a bond between the adhesive layers and the metal laminae but of insufficient magnitude to destroy the integrity of the inner layer in the structured film. The inner thermoplastic layer in the structured film has a melting point at least about 25° F. greater than the melting point of the adhe-

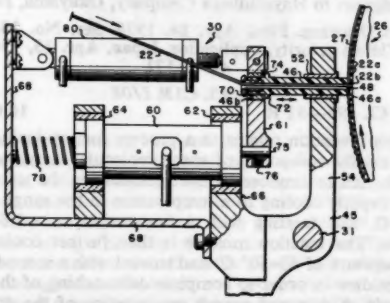


sive layers. In the practice of this method, metal laminae of aluminum strips can be bonded together with an adhesive thermoplastic such as a copolymer of ethylene and acrylic acid. The inner layer is fashioned of a material such as high density polyethylene. The laminate produced by this method is characterized by being free of metal-to-metal contact of the metal laminae. Laminates produced by this method have utility in a variety of fields including packaging and construction.

3,721,598
CONDITIONING OF THERMOPLASTIC COMPOSITIONS FOR BONDING
Stephen D. Marcey, Dayton, Ohio, assignor to The National Cash Register Company, Dayton, Ohio
No Drawing. Filed Feb. 24, 1971, Ser. No. 118,481
Int. Cl. B32b *31/14*; B44d *1/092*
U.S. Cl. 156—330 **15 Claims**

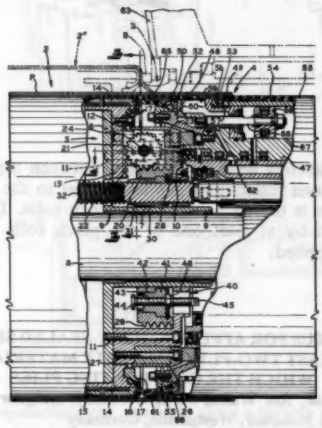
The bonding properties of polyamide or acetal thermoplastic compositions are improved by conditioning the thermoplastic composition prior to bonding. Conditioners such as isopropyl phenol or hexafluoroacetone sesquihydrate have been employed. Conventional epoxy adhesives then are employed to bond the conditioned thermoplastic composition to metallic and non-metallic materials.

3,721,599
METHOD AND APPARATUS FOR SECURING A CONTINUOUS THREAD ON A SUPPORT SURFACE
Kenneth J. Addis, Spartanburg, S.C., assignor to Deering Millikan Research Corporation, Spartanburg, S.C.
Division of Ser. No. 730,301, May 20, 1968, Pat. No. 3,616,001. This application Dec. 8, 1970, Ser. No. 96,082
Int. Cl. B29h *17/28*; B65h *57/12*
U.S. Cl. 156—394 **8 Claims**



A method and apparatus for securing at least one continuous length of thread on a support surface in a desired pattern, wherein the thread and support surface have a pressure sensitive adhesive affinity for each other, and wherein the thread is longitudinally laid on the support surface from a thread guide mechanism moving relative to the support surface while a pressure is intermittently applied against the thread closely adjacent its lay point to minimize movement of the thread on the surface due to tension forces acting on the thread and to minimize damage or dislocation of the thread due to frictional engagement with the thread guide mechanism.

3,721,600
TIRE BUILDING MACHINE
Armindo Cantarutti, Akron, Ohio, assignor to NRM Corporation, Akron, Ohio
Filed Aug. 19, 1970, Ser. No. 65,139
Int. Cl. B29h *17/12*, *17/16*
U.S. Cl. 156—401 **18 Claims**

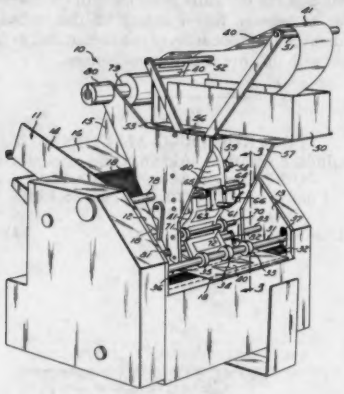


A tire building machine including an expandable drum having a plurality of radially movable drum segments which are simultaneously moved a predetermined amount by controlled axial movement of an annular rack having external teeth in meshing engagement with a plurality of pinions for driving radial racks associated with each of the drum segments. An adjustable stop means may also be provided on the annular rack for limiting axial movement of the rack in the direction of expansion of the radially movable segments, and the ply turn-up and side wall applying mechanism may comprise an inflatable bladder having an axial inner marginal portion clamped to the radially movable drum segments for radial movement therewith into engagement with the tire bead disposed thereabout for uniform and concentric clamping of the tire bead while the remaining portion of the bladder is supported by a rigid support adjacent the end of the drum.

3,721,601
ADDRESS LABELER MEANS
Thomas R. Pituch, Blackwood, N.J., and Stanley E. Truesdell and Brian W. Winston, Mentor, Ohio, assignors to Avery Products Corporation, San Marino, Calif.
Filed Nov. 12, 1970, Ser. No. 88,673
Int. Cl. B44c *1/24*
U.S. Cl. 156—542 **5 Claims**

A machine and method for applying pressure-sensitive adhesive labels to flat articles. The method and machine according to this invention are particularly suitable for applying address labels to envelopes. The apparatus includes feed rolls which are intermittently operated to deliver envelopes into a first set of pinch rolls. The first

set of pinch rolls is continuously driven and grips the envelope while driving the envelope to a second set of pinch rolls. The second set of pinch rolls is driven at a speed corresponding to the speed of the first set of pinch



rolls. A labeling head is positioned between the first and second pinch rollers and applies a label to the article as the article is driven between the pinch rolls. The article is gripped by at least one of the pinch rolls while the label is applied.

3,721,602

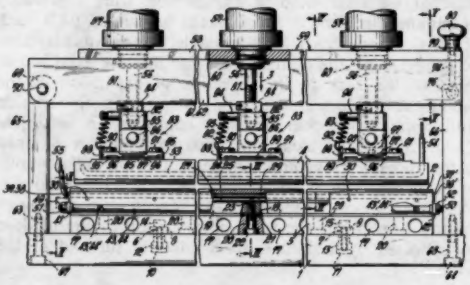
APPARATUS FOR APPLYING HEAT-SEALED SEAMS TO AT LEAST TWO-PLY COMPOSITE MATERIAL OF WHICH THE CONFRONTING PLIES

Frank Bosse, Am Wasserwerk, Germany, assignor to Windmoller & Holscher, Westphalia, Germany

Filed Feb. 2, 1971, Ser. No. 111,842

Int. Cl. B30b *15/34*; B02c *11/08*

U.S. Cl. 156—583 **16 Claims**



The invention relates to an apparatus for applying heat-sealed seams to at least two-ply composite material of which the confronting plies are heat-sealable at the operating temperature and the plies facing heat-sealing jaws are adapted to transmit the sealing heat without changing their structure. Such material is primarily used in machines for making hermetically sealed bags so that the humidity and aroma of the contents remain unaffected by the atmosphere. The inner ply of the bag can be a thermoplastic material while the ply which later forms the outside of the bag is either a non-thermoplastic carrier material such as aluminum foil or paper or a plastics material which has a higher melting point than the inner ply.

3,721,603

CYLINDRICAL BODIES FROM POLYETHYLENE OR POLYPROPYLENE

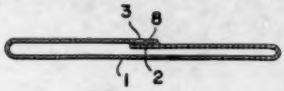
Shigekazu Takeda, No. 141, 1-chome, Chofumine-machi, Ohta-ku, Tokyo, Japan

Division of Ser. No. 649,556, June 28, 1967, Pat. No. 3,597,292. This application Jan. 11, 1971, Ser. No. 105,316

Claims priority, application Japan, July 4, 1966, 41/43431; Sept. 8, 1966, 41/59594

Int. Cl. B32b *3/26, 7/14*

U.S. Cl. 161—92 **5 Claims**



Cylindrical bodies from polyethylene or polypropylene fabrics are prepared with tensile strength at least 22 kg/50 mm, in the bonded and unbonded portions.

3,721,604

CONTINUOUS CULTIVATION OF HYDROCARBON-CONSUMING MICRO-ORGANISMS

Richard S. Silver, Monroeville, Pa., and Joel K. Wong, Bakersfield, Calif., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 883,583, Dec. 9, 1969, abandoned. This application Nov. 4, 1971, Ser. No. 195,827

Int. Cl. C12b *1/00*; A23j *1/18*

U.S. Cl. 195—28 R **17 Claims**

A process for cultivating a hydrocarbon-consuming micro-organism includes the following steps:

1. A culture medium consisting of aqueous nutrient medium, surface active agent and hydrocarbon is seeded with a low cell concentration of a hydrocarbon-consuming micro-organism.

2. Aerobic culturing of the micro-organism is initiated and continued until essentially equilibrium conditions are reached in the logarithmic growth phase.

3. Continuous culturing is initiated and continued under aerobic conditions in the presence of aqueous nutrient medium and hydrocarbon in the absence of added surface active agent.

3,721,605

PROCESS FOR PRODUCING AMYLOSE IN INDUSTRIAL SCALE

Mikihiko Yoshida and Hirao Mamoru, Okayama, Japan, assignors to Hayashibara Company, Okayama, Japan

No Drawing. Filed Apr. 14, 1970, Ser. No. 28,512

Claims priority, application Japan, Apr. 15, 1969, 44/29,171

Int. Cl. C13l *1/08*

U.S. Cl. 195—31 R **10 Claims**

This invention relates to a process for producing amylose chiefly composed of macromolecular amylose from starch rich in amylose by heat gelatinizing the starch and then rapidly cooling to a temperature in the range of 50–60° C. and treating with a heat-resistance α-1,6-glucosidase. The reaction mixture is then further cooled to a temperature of 40–50° C. and treated with a second α-1,6-glucosidase in order to complete debranching of the amylopectin therein and permit precipitation of the amylose. The resultant macromolecular amylose may then be separated therefrom.

3,721,606

GLUTAMINASE GA

Tamotsu Yokotsuka, Nagareyama, and Takashi Iwaasa and Mitsuharu Fujii, Noaa, Japan, assignors to Kikkoman Shoyu Co., Ltd., Noda-shi, Japan

Filed Oct. 13, 1970, Ser. No. 80,279

Claims priority, application Japan, June 13, 1970, 45/50,712

Int. Cl. C12d *13/10*

U.S. Cl. 195—62 5 Claims

Glutaminase GA having the nearly equal activities as a glutaminase and asparaginase, which is useful in the fields of food and pharmaceutical industries, is obtained from *Pseudomonas fluorescens* ATCC 21541.

3,721,607

REAGENT COMPOSITION AND PROCESS FOR THE DETERMINATION OF GLUCOSE

Wolfgang Gruber, Garathshausen; Hans Ulrich Bergmeyer, Tutzing/Obb; Wolfgang Werner, Mannheim-Vogelstang; Erich Bernt, Munich, and Karlfried Gawehn, Tutzing/Obb., all of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Postfach, Germany

Filed Aug. 11, 1971, Ser. No. 170,949

Claims priority, application Germany, Aug. 28, 1970, P 20 42 828.8

Int. Cl. C12k *1/04*

U.S. Cl. 195—103.5 C 13 Claims

Compositions comprising glucose oxidase, peroxidase, a chromogen, a buffer, an azide, and 2,2'-azino-di-(3-ethylbenzothiazoline-6-sulfonic acid) provide remarkably stable test reagents for the enzymatic determination of glucose.

3,721,608

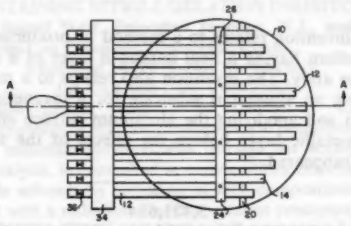
FLUIDIZING DEVICES FOR FLUID BEDS, WITH IN-PROCESS CLEANING

Erik Saller, Stamford, Conn., and Jack Trechock, Woodbury Heights, N.J., assignors to FMC Corporation, New York, N.Y.

Filed July 12, 1971, Ser. No. 161,649

Int. Cl. C10b *43/00*

U.S. Cl. 202—241 3 Claims



A device for feeding fluidized gas into a fluidized-bed vessel, particularly useful in the charring of coal at elevated temperatures, which comprises a series of relatively large pipes disposed near the bottom of the vessel, each affixed to the vessel at only one point to permit ready expansion and contraction, and having a plurality of holes therein to pass fluidizing gas into the vessel, a second smaller pipe in each of the large pipes through most of its length and open at the inner end, one pipe of each pair being connected to a source of fluidizing gas, and the other being connected through a valve to the outside. On start-up, or when finely-divided combustibles begin to accumulate in the large pipes during operation, the valves may be opened so that the fluidizing gas pressure blows out the particulate material, to minimize the occurrence of fires in the pipes with consequent damage.

3,721,609

POLLUTION FREE COKE QUENCHING CAR

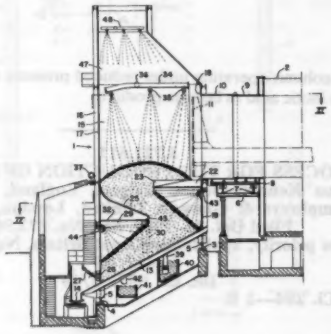
Heinrich Spindeler, Bochum-Langendreer, Germany, assignor to Dr. C. Otto & Comp. GmbH, Christstrasse, Bochum, Germany

Filed May 6, 1971, Ser. No. 140,810

Claims priority, application Germany, May 13, 1970, P 20 23 253.5

Int. Cl. C10b *39/04, 39/12*

U.S. Cl. 202—230 8 Claims



A coke quenching car, movable along a battery of horizontal coke ovens, has a pair of spaced vertical walls extending transversely of the car and defining a fall space between them. The upper part of this space has a front opening for receiving coke from an oven. The space below the opening is closed by a front wall, while the back of the fall space is closed by a back wall. Extending from the bottom of the opening rearwardly in the fall space part way across the car is a ramp as wide as the fall space. A deck slopes from the back wall downwardly below the inner end of the ramp for receiving coke from it and discharging it beneath the ramp onto a floor that slopes from the front wall downwardly to the back wall. The lower part of the back wall has an outlet opening in it that normally is closed by a door. In the upper part of the fall space and also below the ramp and the deck there are water sprays for quenching coke beneath them.

3,721,610

PROCESS FOR THE SEPARATION OF LACTIC ACID FROM WATER AND NITRIC ACID BY RAPID PREEVAPORATION AND DISTILLATION

Gerard Chaintron, Lyon, France, assignor to Rhone-Poulenc S.A., Paris, France

Filed Nov. 23, 1970, Ser. No. 91,801

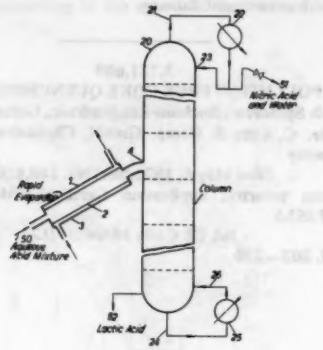
Claims priority, application France, Nov. 24, 1969, 6940393

Int. Cl. C07c *59/08*

U.S. Cl. 203—77 8 Claims

Lactic acid is recovered from aqueous mixtures containing it together with nitric acid, e.g. obtained by hydrolysis of the oxidation product of propylene with nitric acid, by passing the mixture into a rapid evaporator operating at a pressure less than 200 mm. mercury with a residence time less than 5 minutes to give a vaporized phase containing at least 60 percent by weight of the water and nitric acid and less than 40

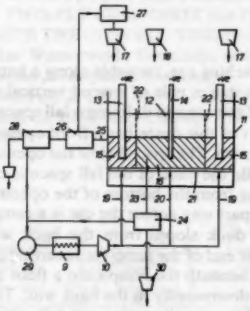
percent by weight of the lactic acid, passing this vaporized phase together with non-vaporized material directly to a distillation column operating under reduced pressure and recovering the lactic acid as bottom product.



3,721,611
PROCESS FOR THE PRODUCTION OF METALS

Gordon Kenneth Jones, Reigate, England, assignor to Humphreys & Glasgow Limited, London, England

Filed Oct. 31, 1969, Ser. No. 872,902
Claims priority, application Great Britain, Nov. 11, 1968, 53,417/68
Int. Cl. B01k *3/04*
U.S. Cl. 204—1 R 9 Claims



A process for the electrodeposition of metal comprises passing an electric current through a cell containing a cathode consisting of a bed of conducting particles of the metal to be recovered fluidized by passing the electrolyte therethrough and supplied with current by a stationary conducting member in electrical contact therewith, the conducting member forming a portion of the total cathode area.

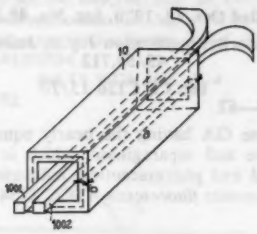
3,721,612
METHOD OF MAKING MAGNETIC CIRCUIT ELEMENTS

Claude R. Gigoux, and Antide Putz, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Nov. 7, 1969, Ser. No. 874,910
Claims priority, application France, Nov. 14, 1972, 72173755
Int. Cl. C23b *5/48*, *7/02*; H01f *3/00*
U.S. Cl. 204—15 9 Claims

The invention has for object a method of manufacturing a magnetic circuit element, consisting of an hollow elongated cylinder.

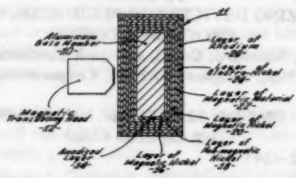
Alternate layers of copper and gold are deposited by electrolysis over a metal substrate thus forming a stacked body. This body is separated from the substrate. Ferromagnetic material is deposited over the stacked body. The cylinder is then formed. The copper inside the cylinder is then removed and replaced by insulating material.



3,721,613
ARTICLE HAVING AN ELECTROLESS DEPOSITION AND METHOD OF PRODUCING SUCH ARTICLE

George E. Wilhelm and Stanley S. Nagy, Studio City, Calif., assignors to Sperry Rand Corporation

Division of application Ser. No. 580,823, Sept. 20, 1966. Continuation of application Ser. No. 871,088, July 22, 1969, now abandoned. This application Dec. 6, 1971, Ser. No. 205,413
Int. Cl. C23b *5/50*; H01r *13/50*
U.S. Cl. 204—29 14 Claims



The invention relates to a method of producing a storage medium having a heat hardened layer of a magnetic metal or alloy. The invention also relates to a method of providing an aluminum substrate for a magnetic storage medium and anodizing the aluminum surface and applying a metallic layer before the effects of the anodizing have disappeared.

3,721,614
PROCESS FOR ENAMELLING STEEL USING AN ELECTROLYTIC NICKEL PREPLATE

Heinz Groschopp; Rudolf Schoenemann, both of Dusseldorf-Holthausen; Hans Gunther Germscheid, Hosel, and Hubert Venschott, Hilden, all of Germany, assignors to Henkel & Cie, GmbH, Dusseldorf, Germany

Filed July 23, 1970, Ser. No. 57,819
Claims priority, application Germany, Sept. 10, 1969, P 19 45 715.9
Int. Cl. C23f *17/00*; C23b *5/08*
U.S. Cl. 204—38 C 12 Claims

A novel process for electroplating nickel before enamelling, particularly direct white enamelling, on degreased and pickled steel surfaces.

3,721,615

PROCESS FOR THE PRODUCTION OF HYDROQUINONE

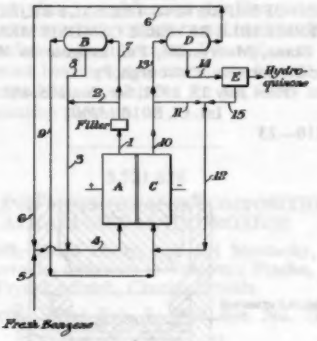
Max Fremery; Hermann Hover, both of Wesseling, and Gert Schwarzlose, Bonn-Bad Godesberg, all of Germany, assignors to Union Rheinische Braunkohlen Kraftstoff Aktiengesellschaft, Wesseling near Cologne, Germany

Filed Feb. 14, 1972, Ser. No. 226,124

Claims priority, application Germany, Feb. 24, 1971, P 21 08 623.7

Int. Cl. C07b 29/06; C07c 37/00, 49/00

U.S. Cl. 204—73 R 1 Claim



Process for the production of hydroquinone by electrochemically oxidizing benzene to quinone and reducing the quinone to hydroquinone. The process involves circulating a finely dispersed recycle stream of benzene and dilute sulfuric acid, which contains no more than 2 percent of quinone related to the benzene, through the anode compartment of an electrolytic cell and a finely dispersed recycle stream of benzene, dilute sulfuric acid and hyroquinone through the cathode compartment of an electrolytic cell whereby the quinone content of the benzene solution introduced into the cathode compartment for reduction is not higher than about 2 percent.

3,721,616

PHOTOPOLYMERIZABLE EPOXY SYSTEMS CONTAINING NITRILE GELATION INHIBITORS

William Russel Watt, Princeton Junction, N.J., assignor to American Can Company, Greenwich, Conn.

Filed May 18, 1971, Ser. No. 144,667

Int. Cl. C08d 1/00; C08f 1/00

U.S. Cl. 204—159.11 22 Claims

Polymerization of epoxide monomers and prepolymers, and of other materials polymerizable through the action of cationic catalysts, is controlled in compositions essentially free of volatile solvents by providing in such compositions, in association with a radiation-sensitive catalyst precursor, a gelation inhibitor in the form of an nitrile compound such as acetonitrile present in small amounts up to several percent by weight.

3,721,617

PHOTOPOLYMERIZABLE EPOXY SYSTEMS CONTAINING CYCLIC AMIDE GELATION INHIBITORS

William Russell Watt, Princeton Junction, N.J., assignor to American Can Company, Greenwich, Conn.

No Drawing. Filed May 18, 1971, Ser. No. 144,642

Int. Cl. B01j 1/00; C08d 1/00

U.S. Cl. 204—159.11 20 Claims

Polymerization of epoxide monomers and prepolymers, and of other materials polymerizable through the action of cationic catalysts, is controlled by providing, in association with a radiation-sensitive catalyst precursor, a gelation inhibitor in the form of a cyclic amide, such as an N-substituted 2-pyridone, or a 2-pyrrolidinone monomer or polymer substituted in the 1-position.

3,721,618

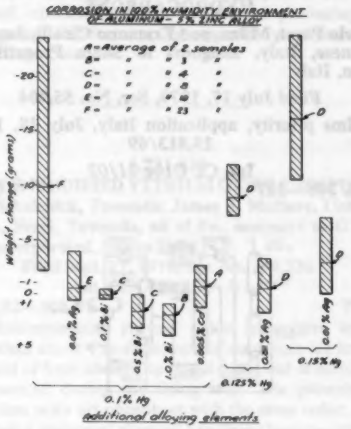
ALUMINUM SACRIFICIAL ANODE

John T. Reding, Lake Jackson, and David W. Barnett, Clute, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed March 11, 1971, Ser. No. 123,284

Int. Cl. C23f 13/00

U.S. Cl. 204—197 14 Claims



An aluminum base alloy comprising about 0.01 to about 0.2 weight percent mercury, about 0.1 to about 20 weight percent zinc, and a heavy metal. The heavy metal can be about 0.03 to about 2.0 weight percent bismuth, about 0.001 to about 0.05 weight percent cadmium, and about 0.001 to about 0.04 weight percent silver. Methods of producing the alloy and of using the alloy as a sacrificial anode are described.

3,721,619

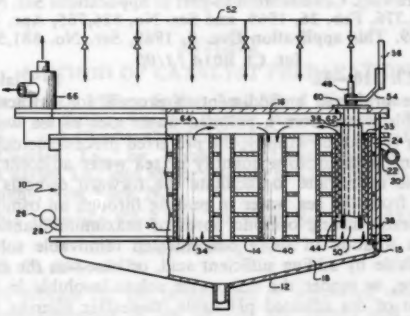
ELECTROLYTIC CELL

Forrest N. Ruehlen, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sept. 25, 1970, Ser. No. 75,317

Int. Cl. B01k 3/04

U.S. Cl. 204—272 10 Claims



An electrolytic cell having a heat exchanging shell disposed therein and dividing the cell container into an upper and lower

electrolyte chamber. Electrode tube means extend through said shell and are in communication with said electrolyte chamber. Electrode means are disposed in said electrode tube means in a manner to preserve said communication. Downcomer tube means, interspersed among said electrode tube means, also extend through the shell into communication with said electrolyte chamber. An auxiliary electrode is disposed in said electrode tube means between the wall thereof and said electrode, with guide vanes disposed on the auxiliary electrode to direct gases formed at the auxiliary electrode toward the inner surface of the electrode tube means.

3,721,620

PROCESS FOR THE EXTRACTION OF AROMATIC HYDROCARBONS

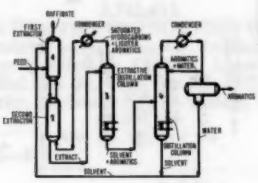
Giancarlo Paret, Milan, and Ermanno Cinelli, San Donato Milanese, Italy, assignors to Snam Progetti S.p.A., Milan, Italy

Filed July 17, 1970, Ser. No. 55,904

Claims priority, application Italy, July 18, 1969, 19,813/69

Int. Cl. C10g *21/02*

U.S. Cl. 208—317 6 Claims



A multi-stage countercurrent process for the solvent extraction of aromatic hydrocarbons from a mixed feed stock is disclosed wherein the feed is contacted with solvent and extracted in a first stage, extract from the first stage is purified in a second stage by countercurrent contact with an overhead fraction from a third stage wherein the second stage extract is distilled, and rectification is effected in a fourth stage wherein water is refluxed and a part of the water, obtained as reflux free of solvent, is vaporized and recycled to the bottom of this rectification stage to recover the sensible heat of lean solvent.

3,721,621

FORWARD-OSMOSIS SOLVENT EXTRACTION

William T. Hough, 312 S. Finley Ave., Basking Ridge, N.J. 07920

No Drawing. Continuation-in-part of applications Ser. No. 813,376, Feb. 26, 1969, and Ser. No. 816,765, Apr. 16, 1969. This application Dec. 2, 1969, Ser. No. 881,572

Int. Cl. B01d *13/00*

U.S. Cl. 210—22 19 Claims

In a preferred embodiment, a process for extracting palatable water from a polluted water such as sea water having typical sea salinity, the preferred process including applying pressure to a quantity of sea water adjacent an osmotic membrane to facilitate the forward osmosis of water from the sea water in passing through an osmotic membrane having osmotic pores of maximum diameter into a solution of more concentrated removable solute removable by adding sufficient acid, or base—as the case may be, to render the removable solute insoluble in the diluent of the adjusted pH value, thereafter filtering the insoluble solute from the water which is collected as the palatable water after adjustment of the pH if and when desirable or necessary.

3,721,622

PROCESS FOR THE BIO-OXIDATION OF NITROGEN DEFICIENT WASTE MATERIALS

Robert K. Finn, 107 Oakwood Lane, and Alex L. Tannahill, 305 Tareyton Drive, both of Ithaca, N.Y.

Filed March 10, 1972, Ser. No. 233,784

Int. Cl. C02c *1/02*

U.S. Cl. 210—11 19 Claims

Nitrogen deficient waste is biooxidized from about 3 to about 12 hours in an aerated zone containing an active pure or semipure culture of aerobic free living nitrogen fixing bacteria.

3,721,623

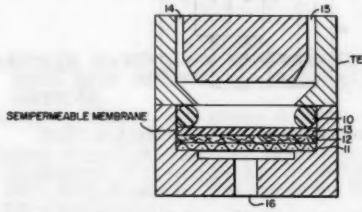
METHOD OF IMPROVING THE SALT REJECTION OF SEMIPERMEABLE REVERSE OSMOSIS MEMBRANES

Regis R. Stana, Murrysville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed July 23, 1971, Ser. No. 165,458

Int. Cl. B01d *13/00*

U.S. Cl. 210—23 8 Claims



A method of improving the salt rejection of supported semipermeable membranes comprises contacting the membrane with sodium phosphate and alkyl or alkylaryl sulfonates.

3,721,624

PROCESS FOR TREATING WASTE EFFLUENT

Richard Fisch and Norman Newman, St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

No Drawing. Filed Nov. 26, 1971, Ser. No. 202,544

Int. Cl. C02c *5/04*

U.S. Cl. 210—47 4 Claims

A process for reducing the pollution level of spent color photographic processing solutions from a process including a thiosulfate-containing fix solution and a phenylene diamine-containing color developer solution, which process comprises adding an oxidizing agent to said spent fix solution to oxidize thiosulfate to sulfate, then adding said oxidized fix solution to said spent color developer solution, thereby insolubilizing said phenylene diamine and forming a sludge, and removing said sludge from said solution.

3,721,625

SOLID LUBRICANT COMPOSITIONS EMPLOYING POLYBENZIMIDAZOLE RESINS AND LUBRICATING PIGMENTS

Bobby D. McConnell, Dayton, Ohio, Melvin T. Lavik, Kansas City, Mo., and Mahlon E. Campbell, Merriam, Kans., assignors to the United States of America as represented by the Secretary of the Air Force

No Drawing. Filed June 11, 1968, Ser. No. 736,009

Int. Cl. C10m *5/22, 5/26*

U.S. Cl. 252—12 6 Claims

Solid lubricant compositions employing polybenzimidazole resins (PBI) and lubricating pigments are produced by admixing finely divided lubricant pigments into a solution of polybenzimidazole resin and solvent therefor. For

example, a solid lubricant composition is produced by dissolving powdered polybenzimidazole in N-methylpyrrolidine to form a solution of about 25 weight percent solids to which is added about 75 weight percent of the solid lubricant pigment comprising a mixture of molybdenum disulfide (MoS_2) and antimony trioxide (Sb_2O_3). The resulting slurry is sprayed onto the surface of a test specimen and the wetted test specimen is placed into an oven where it is dried at 200° F. for one hour. It is then heated at 575° F. for one hour to effect cross-linking and bonding to specimen surface. Other solid lubricant pigments which may be used include molybdenum diselenide, graphite, tungsten disulfide, tungsten diselenide and the like.

Alternatively, the PBI composition can be laminated with fibers of glass, graphite and the like to make preformed structures which can be machined to fit against the metal surface to be lubricated. Fiber glass or graphite fiber reinforced bearing components are formed utilizing the PBI composition as a binder for the fibers as well as for the lubricating pigment.

3,721,626

DESCALING METHOD AND COMPOSITION OF ALKALI METAL HYDROXIDE

Milan Stanek, Vysni Lhoty, and Jiri Mostecky, Prague, Czechoslovakia, assignors to Valcovny Plechu, Narodni Podnik, Frydek-Mistek, Czechoslovakia

No Drawing. Filed Feb. 3, 1969, Ser. No. 797,379

Int. Cl. C02b *5/02*

U.S. Cl. 252—81 12 Claims

A concentrate for use in alkaline descaling baths is formed of alkali metal hydride and alkali metal oxide as active descaling constituents, dispersed or dissolved in alkali metal hydroxide, the latter being present in a sufficient amount to passivate the active descaling constituents prior to introduction of the concentrate into the descaling bath. Generally alkali will be sodium.

3,721,627

BUILDER FOR PHOSPHATE-FREE DETERGENT COMPOSITIONS

James William Adams, Schofield, and Henry Wilbert Hoftiezer, Rothschild, both of Wis., assignors to American Can Company, Greenwich, Conn.

Filed Dec. 7, 1970, Ser. No. 95,992

Int. Cl. C11d *3/12*

U.S. Cl. 252—89 4 Claims

A detergent composition including an anionic or non-ionic surfactant and a novel, hydrophilic but water-insoluble building agent comprising natural cellulose fibers having chemically bonded therein and thereon by in situ polymerization, an alkali salt of polyacrylic acid or polymethacrylic acid.

3,721,628

FERROELECTRIC MATERIALS AND INFRARED DETECTOR DEVICE CONTAINING SAME

Peter John Lock, Chandlersford, and Edward Thomas Keve, Wembley, both of England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed April 26, 1971, Ser. No. 137,174

Claims priority, application Great Britain, April 24, 1970, 19,842/70; Jan. 5, 1971, 440/71

Int. Cl. G01t *1/202*

U.S. Cl. 252—62.9 5 Claims

An organic pyroelectric material such as triglycine sulphate in which a permanent poling of the crystal is effected by addition of a doping ingredient possessing pseudosymmetry.

The poled crystal may be used for constructing an optical device or a pyroelectric detector.

3,721,629

METHOD AND COMPOSITION FOR REMOVING IRON STAINS FROM PORCELAIN

Robert D. Goodenough, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed May 21, 1969, Ser. No. 826,389

Int. Cl. C11d *7/54*

U.S. Cl. 252—105 9 Claims

A solid or liquid composition for removing iron from stains on hard, smooth surfaces, comprising (a) a sufficient amount of a hydrogen ion source to produce a pH of between about 1.5 and 4.5 under operating conditions; (b) an amount of a chelate agent sufficient to couple the Fe^{+++} present in the stain, said chelate agent having a positive formation constant for Fe^{+++} in the pH range of 1.5 to 4.5; (c) a soluble Fe^{++} salt in an amount less than equimolar with respect to the chelate agent; and, optionally, agents capable of producing effervescent gases; disinfectants; detergents; dyes; binders; solvents; perfumes; etc.

3,721,630

SULFUR MODIFIED YTTRIUM OXIDE PHOSPHOR

Emil J. Mehalchick, Towanda; James E. Mathers, Ulster, and John L. Ferri, Towanda, all of Pa., assignors to GTE Sylvania Incorporated, Seneca Falls, N.Y.

Filed Sept. 27, 1971, Ser. No. 184,236

Int. Cl. C09k *1/10, 1/14*

U.S. Cl. 252—301.4 S 7 Claims

Cathodoluminescent yttrium oxide phosphors activated with less than about 4 mole percent of europium are improved by a dopant of from about 1 to about 6 percent of sulfur which is incorporated during the firing step. The phosphors are brighter than prior art phosphors with the same color, in addition to having improved physical handling characteristics.

3,721,631

HUMIDITY SENSORS COMPRISING ALKALI METAL OXIDE, DIVANADIUM PENTOXIDE AND SILICON

Kiyoshi Sumi, and Osamu Asakura, both of Kyoto, Japan, assignors to Shinyei Kaisha, Ikuta-ku, Kobe-shi, Japan

Filed Aug. 16, 1971, Ser. No. 172,055

Int. Cl. H01c *13/00*; G01n *31/06*

U.S. Cl. 252—408 10 Claims

A humidity sensor having a negative relative humidity coefficient of resistivity comprises 0.10 to 12.00 mole percent of alkali metal oxide, 0.05 to 10.00 mole percent of divanadium pentoxide and the balance substantially all silicon.

3,721,632

METHOD OF CATALYST PREPARATION

Clarence O. Miller, Sulfur, La., Floyd Welch, deceased, late of Sulfur, La., by Bonnie Welch, heiress, Sulfur, La., and Charles G. McAlister, deceased, late of Lake Charles, La., by Bernice McAlister, heiress, Lake Charles, La.; said Miller assignor to Cities Service Company, New York, N.Y.

No Drawing. Filed Dec. 30, 1970, Ser. No. 102,998

Int. Cl. B01j *11/78*

U.S. Cl. 252—442 4 Claims

A process for the preparation of supported catalysts. The components of the catalyst are melted and mixed with a suitable porous support material or carrier. On cooling, the support material is coated and/or impregnated with the solidified catalyst.

3,721,633

AQUEOUS BUILT LIQUID DETERGENTS CONTAINING ALKYL GLYCOSIDES

Humbert J. Ranauto, Wilmington, Del., assignor to Atlas Chemical Industries, Inc., Wilmington, Del.

No Drawing. Filed Oct. 6, 1969, Ser. No. 864,165

Int. Cl. C11d *1/66, 3/06, 17/08*

U.S. Cl. 252—527 11 Claims

Disclosed are aqueous built liquid detergent compositions which do not require the presence of a hydrotrope to prevent phase separation. The detergent compositions are an aqueous solution of an alkyl glycoside and a builder selected from the group consisting of potassium nitrilotriacetate, sodium nitrilotriacetate, and a potassium polyphosphate.

3,721,634

POLYMERIZATION PROCESS

John Versnel, Plainsboro, N.J., assignor to Cities Service Company, New York, N.Y.

No Drawing. Filed July 30, 1971, Ser. No. 167,800

Int. Cl. C08j *1/26*

U.S. Cl. 260—2.5 FP 10 Claims

Metallic iron is used as an ingredient of the polymerization recipe to improve the melt flow of a polymer, prepared by polymerizing at least one vinylidene monomer, e.g., styrene, in the presence of a halogenated flame retardant. A preferred embodiment of the invention is the improvement of the melt flow of a foamable polymer prepared by suspension polymerization, with the consequent improvement of the dimensional stability of a self-extinguishing foam prepared therefrom.

3,721,635

TRANSFER MEDIUM FOR PRODUCING SCRATCH AND SMUDGE RESISTANT MARKS AND A PROCESS FOR MAKING THE SAME

Charles T. Fellows, Kettering, and Stanley R. Hermann, Xenia, Ohio, assignors to The National Cash Register Company, Dayton, Ohio

No Drawing. Original application May 6, 1970, Ser. No. 35,230, now Patent No. 3,639,166. Divided and this application Nov. 3, 1971, Ser. No. 195,496

Int. Cl. C08f *45/52*

U.S. Cl. 260—28.5 A 25 Claims

A transfer medium comprising a base having a transferable coating composition thereon. The coating composition comprises about 3 to 40 percent by weight of an olefinic polymer; about 3 to 40 percent by weight of a wax; about 15 to 70 percent by weight of a thermoplastic aminotriazine-sulfonamide-aldehyde resin; and about 1 to 45 percent by weight of a sensible material.

3,721,636

FREEZE-THAW STABLE HIGH SOLIDS LATEXES OF INTERPOLYMERS OF VINYL CHLORIDE, ETHYLENE AND CERTAIN CARBOXYL-CONTAINING MONOMERS

Samuel J. Makower, 1492 Wistar Drive, Wyncote, Pa. 19005; Philip A. Cautilli, 2012 Shadybrook Lane, Feasterville, Pa. 19047; and Jack Dickstein, 318 Keats Road, Huntingdon Valley, Pa. 19006

No Drawing. Filed Nov. 12, 1970, Ser. No. 88,975

Int. Cl. C08f *29/24*

U.S. Cl. 260—29.6 RW 10 Claims

This invention relates to freeze-thaw stable latexes of vinyl chloride interpolymers whose composition by weight includes between about 6 and 30% ethylene and between about 0.5 and 10% of a coreactive carboxylated monomer selected from the group consisting of acrylic acid, methacrylic acid, crotonic acid and the monoesters of maleic, fumaric, itaconic and aconitic acids with alcohols having from one to ten carbon atoms. The latexes have particular utility as adhesives for the durable bonding of polymeric films such as polyvinyl chloride to aluminum, iron and other metals, such as in structural siding. The method of making the latexes comprises maintaining under ethylene pressure an aqueous composition containing a seed latex and a free-radical initiating system and having a pH not greater than 5, and gradually adding thereto the monomers to be interpolymerized over a period of at least six hours. The method can be used to make stable latexes containing as high as about 55% solids.

3,721,637

METHOD FOR DISPERSING ASBESTOS FIBERS

Fred D. Schultz, 1820 Bradford St., Plainfield, N.J. 07061, and Howard J. Fogel, 210 Lucia St., Middlesex, N.J. 08846

No Drawing. Continuation of application Ser. No. 874,071, Nov. 4, 1969. This application Nov. 8, 1971, Ser. No. 196,757

Int. Cl. C08f *15/02, 15/26*

U.S. Cl. 260—29.6 M 5 Claims

A method for dispersing asbestos fibers employing low concentrations of selected acrylic or methacrylic acid polymers is described; said method providing dispersions being particularly characterized by their excellent homogeneity.

3,721,638

PROCESS FOR THE POLYMERIZATION OF TETRAFLUOROETHYLENE IN AQUEOUS PHASE AND PRODUCTS OBTAINED THEREFROM

Dario Sianesi; Giancarlo Bernardi, Canzo, and Gianfranco Veroli, all of Milan, Italy, assignors to Montecatini Edison S.p.a., Milan, Italy

Filed Aug. 6, 1969, Ser. No. 848,772

Claims priority, application Italy, Aug. 8, 1968, 19948 A/68

Int. Cl. C08f *45/24*

U.S. Cl. 260—29.6 F 14 Claims

Improved high molecular weight tetrafluoroethylene polymers are obtained in the form of hydrophilic aqueous gel or hydrophobic fine powder compatible with organic plasticizing fluids by aqueous phase polymerization at super-atmospheric pressure and temperature between about 0°C and 120°C, in presence of known polymerization initiators and of at least one perfluorinated ether ketone. Hydrophilic gel can be transformed to hydrophobic powder to several alternate techniques. Products are more easily processable than those produced by prior processes, and can be formed into manufactured articles having superior physical and mechanical characteristics.

3,721,639

PROCESS FOR CASTING POLYPHENYLENE OXIDE FILMS ON STAINLESS STEEL SUPPORTS USING A VEGETABLE OIL ADDITIVE

Jean Gattus, 43 Rue des Charmettes, 69 Villeurbanne, and Maurice Mallet, 37 Rue Servient, Lyon, both of France

Continuation-in-part of Ser. No. 882,804, Dec. 5, 1969, abandoned. This application July 19, 1971, Ser. No. 164,010

Claims priority, application France, Dec. 9, 1968, 68177237

Int. Cl. C08g *23/18*

U.S. Cl. 260—18 PF 8 Claims

Polyphenylene oxide containing films which do not adhere to stainless steel casting plates are formed from compositions containing polyphenylene oxide and a vegetable oil which may be epoxidized.

3,721,640

CROSSLINKABLE COATING AGENTS

Hans Wilhelm, 6700 Ludwigshafen; Klaus Gulbins, and Heinrich Hartmann, both of 6703 Limburgerhof, all of Germany, assignors to Badische Anilin & Soda-Fabrik Aktiengesellschaft, Ludwigslafen am Rhine, Germany

Continuation-in-part of Ser. No. 686,754, Nov. 29, 1967, abandoned. This application Dec. 3, 1970, Ser. No. 94,986

Claims priority, application Germany, Dec. 3, 1966, P 16 69 078.1

Int. Cl. C08f *45/34*

U.S. Cl. 260—31.2 N 16 Claims

Crosslinkable coating agents based on an organic dispersion (I) of a crosslinkable copolymer (A) which dispersion is stable without an emulsifier and a diisocyanate or polyisocyanate (II). The organic dispersion (I) of the copolymer (A) is prepared by the copolymerization of:

a. polymerizable compounds containing hydroxyl groups, with
b. other comonomers in
c. an organic liquid in which the copolymer (A) formed is not soluble, and in the presence of (B) a copolymer of comonomers from groups (a) and (b) and which is soluble in the organic liquid (c).

3,721,641

FLEXIBLE VARNISH

James A. Whitt, Fort Wayne, Ind., assignor to General Electric Company

No Drawing. Filed Feb. 25, 1971, Ser. No. 119,018

Int. Cl. C08g *37/18*

U.S. Cl. 260—33.4 EP 10 Claims

An electrically insulating varnish characterized as having flexibility and long shelf life is composed of a polyester resin and epoxy resin wherein the weight ratio of polyester resin to epoxy resin is about 1.8:1, and phenolic resin, the phenolic resin being present to the extent of about 13 weight percent.

3,721,642

POLYMERIZABLE UNSATURATED POLYESTER COMPOSITION CONTAINING THERMOPLASTIC ADDITIVE

Edmund Schalin and Joseph J. Dietrich, Mentor, Clarence L. Sturm and Reynold A. Berkey, Painesville, and John R. Semancik, Mentor, Ohio, assignors to Diamond Shamrock Corporation, Cleveland, Ohio

No Drawing. Filed Dec. 10, 1970, Ser. No. 96,994

Int. Cl. C08f *21/02*; C08g *51/04, 51/18*

U.S. Cl. 260—40 R 12 Claims

Thermosetting molding compositions are prepared using polymerizable unsaturated polyesters, polymerizable unsaturated monomers and polymers derived from the polymerization of a mixture of vinyl chloride and vinyl acetate. Fillers and reinforcing agents are incorporated in the compositions to obtain the desired physical and chemical properties in end use applications. These compositions produce molded articles having low shrinkage, dimensional stability, and improved surface smoothness characteristics.

3,721,643

UNSATURATED POLYESTER RESIN COMPOSITIONS

Silvio Vargiu, Sesto S. Giovanni, and Beppino Passalenti, Milan, all of Italy, assignors to Societa Italiana Resine S.P.A., Milan, Italy

Filed Nov. 18, 1971, Ser. No. 200,193

Claims priority, application Italy, Nov. 26, 1970, 32209 A/70

Int. Cl. C08g *51/04*

U.S. Cl. 260—40 R 17 Claims

Polyester compositions for pre-impregnates comprise 50 – 60 parts resin diluted in styrene, 40 – 50 parts inert filler, up to 1 part magnesium oxide, and catalyst.

3,721,644

THERMOSETTING ACRYLIC RESINS AND THEIR USE AS BINDERS IN DENTAL FILLING COMPOSITIONS

Donald G. Stoffey, Hacienda Heights, and Henry L. Lee, Jr., San Marino, Calif., assignors to Lee Pharmaceuticals, South El Monte, Calif.

No Drawing. Filed Dec. 28, 1970, Ser. No. 102,044

Int. Cl. C08f *45/04*

U.S. Cl. 260—41 A 4 Claims

Bisphenol-A-bis(2,3 - dimethacrylatopropyl ether) and the adduct of methacrylic acid and triglycidyl ether of trihydroxy biphenyl are utilized as binders for dental restorative compositions.

3,721,645

POLYURETHANES STABILIZED WITH 1,2,3-,1,2,4-1,2,5-, AND 1,3,4-TRIAZOLES

John C. Zemlin, Reading, Mass., assignor to Liner Technology, Inc., Burlington, Mass.

Filed Feb. 25, 1971, Ser. No. 118,983

Int. Cl. C08g *51/60, 22/32*

U.S. Cl. 260—45.8 N 8 Claims

Improved process for preparation of stabilized but reactive polyurethanes, the stabilizer compositions containing amounts of either substituted or unsubstituted triazoles, and the polyurethane compositions prepared from di- or poly-isocyanates, polyols, and at least one of the selected triazoles.

3,721,646

PROCESS FOR THE PREPARATION OF SELF-EXTINGUISHING POLYMERS

Rosario Lanzo, Mantova, and Nicolino Rainaldi, Mestre, both of Italy, assignors to Montecatini Edison S.p.A., Milan, Italy

Filed April 8, 1970, Ser. No. 26,794

Claims priority, application Italy, April 10, 1969, 15341 A/69

Int. Cl. C09k *3/28*

U.S. Cl. 260—45.7 R 3 Claims

A process for producing self-extinguishing polymers in which, during the polymerization of a styrene-based monomeric composition, there is added a bromofluorohydrocarbon (alkane) of the general formula:

$$C_nBr_xF_y,$$

wherein n is a integer ranging from 1 to 8, y is greater than x and $x+y=2n+2$.

3,721,647

ONE-PACKAGE HEAT-CURABLE URETHANE POLYMER CASTING COMPOSITION

Michael P. Mazzeo, Hightstown, N.J.; Riad H. Gobran, Levittown; Anthony F. Santaniello, Newtown, and Marina N. Gillis, Morrisville, all of Pa., assignors to Thiokol Chemical Corporation, Bristol, Pa.

Continuation-in-part of Ser. No. 77,354, Oct. 1, 1970, abandoned. This application Dec. 20, 1971, Ser. No. 210,195

Int. Cl. C08g *51/58, 22/32*

U.S. Cl. 260—45.7 R 20 Claims

A one-package heat-curable urethane polymer casting composition which comprises three components is disclosed. The first component is a urethane prepolymer in which the isocyanate terminals have been blocked with a high molecular weight, solid, non-volatile, substituted phenol. The second component is a curative diamine in curative amounts. The third component is an organic acidic material in stabilizing amounts. The resultant composition of these components is stable at ambient temperature conditions. On the application of heat, however, this composition forms a void-free polyurethane which maintains its desirable urethane properties. Said composition is designed to be cast into thick sections, as opposed to thin films or coatings.

3,721,648

RADIATION-CROSSLINKABLE POLYMERS PREPARED FROM OLEFINICALLY UNSATURATED MONOMERS AND VINYLENE CARBONYL MONOMERS

Bodo Ehrig; Erwin Muller, and Ludwig Mott, all of Leverkusen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed March 16, 1971, Ser. No. 124,948

Claims priority, application Germany, March 20, 1970, P 20 13 414.9

Int. Cl. C08g *33/10, 15/00*

U.S. Cl. 260—47 UA 6 Claims

Polymers and Copolymers of olefinically unsaturated monomers with radiation-crosslinkable vinylene carbonyl groups (—CH=CH—CO—) or vinylene carbonyl vinylene groups (—CH=CH—CO—CH=CH—) are obtained by radicalic polymerization in heterogeneous phase at a temperature between about 0°–150° C.

3,721,649

PHTALEIN-FLUORAN SEMICONDUCTIVE POLYMERS

Mario Dominguez-Burguette, Lake Elmo Village, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed June 19, 1970, Ser. No. 47,861

Int. Cl. C08g *15/00*

U.S. Cl. 260—47 C 4 Claims

A semiconductive phthalein-fluoran polymer adapted for use in a friction element in an electrostatic device of the Johnsen-Rahbek type. The semiconductive polymer is produced produced by a Friedel-Crafts type condensation reaction, e.g. of an alpha hydroxyanthraquinone or an alpha hydroxynaphthalene with phthalic anhydride, 1,8-naphthalic anhydride, or 3,4,5,6-tetrahydrophthalic anhydride, at a reaction temperature in the range of from 259° to 268°C.

3,721,650

REACTIVE HYDROXYALKYL-ONIUM CATALYSTS FOR SYNTHESIS OF POLYOXAZOLIDONES

Gaetano F. D'Alelio, 2011 E. Cedar St., South Bend, Ind. 46617

No Drawing. Filed Mar. 22, 1971, Ser. No. 126,946

Int. Cl. C08g *30/04*

U.S. Cl. 260—47 EP 19 Claims

A process for preparing polyoxazolidones is provided in which a polyepoxide is reacted with a polyisocyanate in the presence of chemically reactive hydroxyalkyl-onium catalysts, selected from the class of ammonium and phosphonium halides having at least two hydroxyalkyl groups. Novel polymers are obtained when these new catalysts containing two or more hydroxy groups are condensed with polyisocyanates.

3,721,651

CATIONIC RESIN PREPARED BY TWO STAGE CONDENSATION OF MELAMINE, FORMALDEHYDE AND ALIPHATIC HYDROXYLATED MONOAMINE

Raymond W. Yates, West Bromwich, England, assignor to British Industrial Plastics Limited, Manchester, England

No Drawing. Filed May 22, 1970, Ser. No. 39,885

Claims priority, application Great Britain, May 22, 1969, 26,265/69

Int. Cl. C08g *9/30*

U.S. Cl. 260—29.4 R 19 Claims

Production of cationic resin syrup comprising modified melamine-formaldehyde resin by two-stage condensation of melamine, formaldehyde and an aliphatic hydroxylated monoamine, the ratio of formaldehyde to melamine being between 2:1 and 6:1, the solids content of the reactants at least 60 wt. percent, the first stage of condensation being carried out at pH greater than 8.5 and the second stage carried out at pH in range 7.0–8.5. Where storage is required, the pH is adjusted after condensation to 6.5–7.5. The product is of particular value in increasing wet-strength of paper.

3,721,652

POLYMERS OF 2-PYRROLIDONE

Carl E. Barnes, New Canaan, Conn., assignor to Radiation Research Corporation, Stamford, Conn.

Continuation-in-part of application Ser. No. 763,898, Sept. 30, 1968, which is a continuation-in-part of application Ser. No. 711,926, Mar. 11, 1968. This application Sept. 3, 1970, Ser. No. 69,471

Int. Cl. C08g *20/16*

U.S. Cl. 260—78 P 17 Claims

2-pyrrolidone is polymerized to a new white, high molecular weight polymer being particularly suitable for melt extrusion into fibers, films and other shaped articles. A continuous process of polymerization is described.

3,721,653

POLYAMIDE FIBERS FROM MIXTURE OF BIS-(P-AMINOCYCLOHEXY)METHANE AND 4,4'-METHYLENE DIANILINE

Robert W. Campbell, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed April 12, 1971, Ser. No. 133,416

Int. Cl. C08g *20/20*

U.S. Cl. 260—78 R 10 Claims

Polyamide fibers employing 4,4'-methylenedianiline or a methyl derivative thereof as a comonomer in combination with bis(p-aminocyclohexyl)methane or methyl derivative thereof and an acyclic C_8 to C_{16} dicarboxylic acid have improved dyeability with retention of crystallinity.

3,721,654

PROCESS FOR PREPARING COPOLYMERS OF MALEIC ANHYDRIDE AND 2-ALKOXY-PROPENE

Peter Schlumbom, Irvington, and David A. Gordon, Scarsdale, both of N.Y., assignors to Ciba-Geigy Corporation, Greenburgh, N.Y.

Continuation-in-part of Ser. No. 888,832, Dec. 29, 1969, Pat. No. 3,635,916. This application Nov. 2, 1970, Ser. No. 86,371

Int. Cl. C08f *17/00*

U.S. Cl. 260—78.5 R 5 Claims

A process for the preparation of maleic anhydride/2-alkoxypropene copolymers which comprises polymerizing maleic anhydride and 2-alkoxypropene in an organic solvent in the presence of a radical catalyst. The resulting copolymers have an intrinsic viscosity of from about 0.1 to about 0.5 at 30°C in tetrahydrofuran. When esterified, the copolymers are useful in treating leather and in hairspray compositions.

3,721,655

COPOLYMERS OF HALFESTERS OF MALEIC ANHYDRIDE AND -ALKOXYPROPENE

Peter Schlumbom, Irvington, and David A. Gordon, Scarsdale, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 888,832, Dec. 29, 1969, Pat. No. 3,635,916. This application Jan. 8, 1971, Ser. No. 105,081

Int. Cl. C08f *29/38*

U.S. Cl. 260—78.5 T 3 Claims

Alkylene oxide monoether halfesters of maleic anhydride/2-alkoxypropene copolymers and alkyl and alkylene oxide mixed halfesters of said copolymers are homogeneous film-forming compositions useful in hair spray preparations. These

halfesters are prepared by the esterification of the maleic anhydrive/2-alkoxypropene copolymer with an appropriate alcohol.

3,721,656

METHOD OF PRODUCING STABLE POLYURETHANE SOLUTIONS

Yuichi Ikeda, Yokohama; Choji Yuyama, Kosakai; Tsuguhisa Hirukawa, Kosakai, and Yoshio Isshiki, Kosakai, all of Japan, assignors to Ameliotex, Inc., New York, N.Y.

Filed Sept. 3, 1971, Ser. No. 177,632
Int. Cl. C08g *22/04*
U.S. Cl. 260—77.5 AA 4 Claims

A method for improving the solution stability and homogeneity of substantially linear polyurethanes obtained by the reaction in solution of a diamine chain extending agent with an isocyanate-terminated prepolymer.

3,721,657

HYDROPHILIC GEL POLYMERS OF VINYLPYRROLIDINE AND HYDROXYALKYL METHACRYLATE

Maurice Seiderman, 3306 Deronda Drive, Los Angeles, Calif.

Continuation-in-part of Ser. No. 845,499, July 28, 1969, Pat. No. 3,639,524. This application Nov. 23, 1970, Ser. No. 92,280
Int. Cl. C08f *17/00*
U.S. Cl. 260—80.72 24 Claims

A plastic or resin product obtained by mixing a comminuted pyrrolidone such as polyvinylpyrrolidone, and optionally modifiers and additives such as organic methacrylates, and optionally crosslinking agents, and optionally catalysts, and causing polymerization to take place by elevating the temperature. The inventive product is insoluble in water but is hydratable with water, depending upon proportions of above mentioned components, and may take up in its structure as little as 5 percent by weight of water to as high as 90 percent by weight of water. The inventive hydrated product is optionally transparent, translucent, or opaque, and produced in any shape or size, depending only on the mold in which it is cast. The transparent product is especially suitable for contact lenses. The translucent and opaque products may be fabricated into membranes with pore sizes that can be made selectively, or cast into useful shapes and for other uses.

3,721,658

METHOD OF PREPARING HIGH SOFTENING POINT THERMOPLASTICS

Ghazi Mourad Dickakian, Sterrebeck, Belgium, assignor to Esso Research and Engineering Company

Filed May 3, 1971, Ser. No. 139,866
Claims priority, application Great Britain, May 5, 1970, 21,629/70
Int. Cl. C08f *15/42*
U.S. Cl. 260—82 8 Claims

High softening point thermoplastic materials are prepared by the contacting of steam-cracked tar or fractions thereof with oxygen containing gases in the presence of a catalyst comprising salts of iron, copper, aluminum and zinc. The product materials result from the oxidative polymerization which occurs at temperatures in the range of 200° to 300° C. and are useful binder materials for the manufacture of fiberboard and other products.

3,721,659

TREATMENT OF RUBBER

Maurice Edward Cain, Welwyn Garden City; Geoffrey Thomas Knight, Shefford; Keith Frederick Gazeley, and Peter McHigh Lewis, both of Hitchin, all of England, assignors to The Natural Rubber Producers' Research Association, London, England

Filed Nov. 16, 1970, Ser. No. 90,138
Claims priority, application Great Britain, Nov. 28, 1969, 58,403/69
Int. Cl. C08d *5/02*
U.S. Cl. 260—83.3 6 Claims

Novel urethane reaction products of aromatic nitroso compounds with isocyanates are used to improve the resistance of unsaturated rubbers to oxidative degradation by providing antioxidant groups bound to the rubber molecules. Dry rubber or rubber latex is conveniently reacted with decomposition products of the urethane during normal vulcanization.

3,721,660

MOLECULAR SIZING TECHNIQUE FOR PREPARING LOW MOLECULAR WEIGHT COPOLYMERS OF ISOBUTYLENE AN CONJUGATED POLYENES

Jerome Robert Olechowski, Trenton, N.J., assignor to Cities Service Company, New York, N.Y.

No Drawing. Filed May 28, 1971, Ser. No. 148,243
Int. Cl. C08d *5/00*; C08f *1/88*
U.S. Cl. 260—85.3 R 24 Claims

Low molecular weight butyl-type copolymers having narrow molecular weight distributions are prepared by contacting a higher molecular weight butyl-type copolymer, e.g., a butyl rubber, with a catalyst composition comprising a transition metal salt, an organometallic compound of a metal of Group I–A, II–A, II–B, or III–A of the Periodic Table, a proton donor, and an alkene. The catalyst composition preferably comprises a halide of tungsten, molybdenum, or rhenium, an alkyl aluminum halide, a lower alkanol, and an alkene containing 2–4 carbon atoms.

3,721,661

PROCESS FOR PRODUCING POLYISOBUTENE

Ermanno Susa, 44 Via Del Navali, Trieste, Italy

No Drawing. Continuation-in-part of application Ser. No. 37,452, May 15, 1970, and a continuation of application Ser. No. 610,254, Jan. 19, 1967, now abandoned. This application May 5, 1971, Ser. No. 140,570
Claims priority, application Italy, Jan. 25, 1966, 13,774/66
Int. Cl. C08f *3/14*
U.S. Cl. 260—94.8 3 Claims

Process for regulating the molecular weight of polyisobutene and producing high polymer yields by using tert. butyl chloride as the molecular weight regulator during the polymerization of isobutene in the presence of a Friedel-Crafts catalyst and a solvent having a low dipole moment.

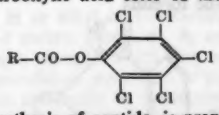
3,721,662

METHOD FOR PRODUCING AN ACTIVE CARBOXYLIC ACID ESTER

Masahiko Fujino, Hyogo, and Chitoshi Hatanaka, Suita, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

No Drawing. Filed Feb. 2, 1968, Ser. No. 702,555
Claims priority, application Japan, Feb. 4, 1967, 42/7,401; June 26, 1967, 42/40,900
Int. Cl. C07c *67/02*, *103/52*
U.S. Cl. 260—112.5 7 Claims

An active carboxylic acid ester of the formula



useful in the synthesis of peptide, is prepared by reacting formic acid, certain hydrocarbon-carboxylic acids, N-protected amino acids or a peptide with protected terminal

amino group with pentachlorophenyl dichloroacetate or pentachlorophenyl trichloroacetate, in the presence of a tertiary amine or dicyclohexylamine.

3,721,663

NOVEL METHOD FOR PREPARING ASCORBIC ACID COMPOUNDS AND NOVEL INTERMEDIATES FOR PREPARING SAME

David F. Hinkley, Plainfield, and Alexander M. Hoinowski, Union, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

No Drawing. Continuation-in-part of application Ser. No. 689,287, Dec. 11, 1967. This application Mar. 2, 1970, Ser. No. 15,958

Int. Cl. C07c *47/18*

U.S. Cl. 260—210 R 5 Claims

Process for preparing ascorbic acid compounds by catalytic oxidation of a loweralkyl sorboside or loweralkyl fructoside to form the corresponding glycosidic acid which is then simultaneously hydrolyzed and lactonized. Novel α-loweralkyl glycoside of 2-keto-gulonic acid is useful as an intermediate in the preparation of ascorbic acid.

3,721,664

PREPARATION OF 5-CYTOSINE NUCLEOSIDES

Max Hoffer, Nutley, N.J., assignor to Hoffman-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 811,666, March 28, 1969, abandoned. This application Jan. 27, 1970, Ser. No. 6,289

Int. Cl. C07c *51/52*

U.S. Cl. 260—211.5 R 5 Claims

Cytosine nucleosides are prepared by silylating cytosine or a 5-substituted cytosine derivative, condensing the silyl derivative with an acylated sugar halide and saponifying the condensation product. The process is used in preparing known chemotherapeutically useful cytosine nucleosides, particularly the anti-viral 5-fluorocytosine arabinoside and 1-β-D-arabino furanosyl-cytosine.

3,721,665

STARCH BASED POLYETHER POLYOLS

Philip Hotchkiss Moss and Michael Cuscurida, Austin, Tex., assignors to Jefferson Chemical Company, Inc., Houston, Tex.

No Drawing. Original application June 29, 1970, Ser. No. 50,901. Divided and this application Oct. 7, 1971, Ser. No. 187,564

Int. Cl. C08b *19/06*

U.S. Cl. 260—233.3 R 8 Claims

A starch based polyol for polyurethanes is described which is made by reacting cornstarch with glycol ethers and alkoxylating the resulting reaction product.

3,721,666

1 - (PHENYL OR PYRIDYL) - 4 - (ALKYL OR ALKENYL)-3H- 1,4 - BENZODIAZEPINE-2,5-(1H,4H)-DIONES

Karl-Heinz Weber, Gau-Algesheim, Karl Zeile and Peter Danneberg, Ingelheim am Rhein, Rolf Giesemann, Bingen, Adolf Bauer and Herbert Merz, Ingelheim am Rhein, and Franz Josef Kuhn, Bingen, Germany, assignors to Boehringer G.m.b.H., Ingelheim am Rhein, Germany

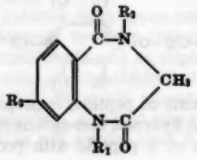
No Drawing. Continuation-in-part of applications Ser. No. 777,193, Nov. 19, 1968, and Ser. No. 24,837, Apr. 1, 1970. This application Nov. 12, 1971, Ser. No. 198,429

Claims priority, application Germany, Apr. 9, 1969, P 19 18 072.4

Int. Cl. C07d *53/06*

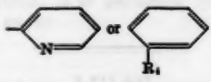
U.S. Cl. 260—239.3 D 11 Claims

Compounds of the formula



wherein

R_1 is



where R_4 is hydrogen, halogen, nitro or trifluoromethyl, R_2 is alkyl of 1 to 4 carbon atoms or allyl, and R_3 is chlorine, bromine, nitro, trifluoromethyl or cyano, which are useful as psychosedatives and anticonvulsives.

3,721,667

NOVEL ANTIBACTERIAL COMPOUNDS AND A PROCESS FOR THE PREPARATION OF THE SAME

Saburo Ueno; Etsuzo Shimogo, Takao Kawasaki, Daisaku Inmaru, Fumio Hirose, Satoshi Heya, Yoshio Omura, Yoshiaki Osaka, Takayoshi Fujii, and Osamu Otake, all of Tokyo, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Tokyo; Yoshio Omura, Tanashi-shi, Tokyo; Yoshiaki Osaka, Nezu, Bunkyo-ku, Tokyo; Takayoshi Fujii, Touwa, Adachi-ku, Tokyo, and Osamu Otake, Chofu-shi, Tokyo, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

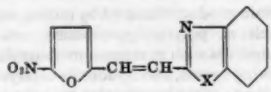
Filed May 26, 1970, Ser. No. 40,733

Claims priority, application Japan, May 30, 1969, 44/42331; May 30, 1969, 44/42332

Int. Cl. C07d *85/48, 91/42*

U.S. Cl. 260—240 A 3 Claims

There are described new chemical compounds, or more specifically 1-(5-nitrofuryl)-2-(2-cyclohexeno-azolyl)-ethylene of the following formula:



wherein X is a member selected from the group consisting of oxygen and sulfur.

and a method for the preparation of the same, as well as compositions containing the same.

These new compounds represent superior antibacterial properties and a low mammalian toxicity, and are not subjected to inactivation in medium. The method for the preparation thereof comprises: reacting a compound selected from the group consisting of 2-methylcyclohexeno-oxazole and 2-methyl-cyclohexeno-thiazole with a compound selected from the group consisting of 5-nitro-furfural and the diacetate thereof.

3,721,668

NOVEL 5-NITRO-IMIDAZOLE ANTIMICROBIALLY EFFECTIVE COMPOUNDS

Clemens Rufer; Rudolf Albrecht; Hans-Joachim Kessler, and Eberhard Schroeder, all of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin, Germany

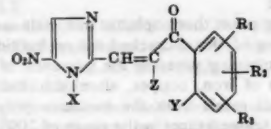
Filed July 8, 1970, Ser. No. 53,298

Claims priority, application Germany, July 10, 1969, P 19 35 685.5

Int. Cl. C07d *49/36*

U.S. Cl. 260—240 J 47 Claims

5-Nitro-imidazoles of the formula



wherein X is hydrocarbon or a free or esterified hydroxy group; Y and Z each are H or, collectively, a bridging group

consisting of $-CH_2-$ and/or one of O, S, SO and SO_2, $-CH_2CH_2-$, or $-CHA-$ wherein A is $-CH_3$, $-C_2H_5$ or $-C_6H_{nA}$; R_1 and R_2 each are alkyl, halogen or free, esterified or etherified —OH; and R_3 is H, alkyl, substituted alkyl, halogen, free, esterified or etherified —OH, amino, amido or aminoalkoxy; have antibacterial and antifungal activity, particularly against protozoa and especially against *Trichomonas vaginalis*.

3,721,669

PROCESS FOR THE NITROSYLATION OF ORGANIC COMPOUNDS

Yvon G. M. Conseiller, Paris, and Gerard J. Fontaine, Choisy-Le-Roi, both of France, assignors to Rhone-Poulene S.A., Paris, France

Filed Sept. 18, 1970, Ser. No. 73,621

Claims priority, application France, Sept. 22, 1969, 6932160

Int. Cl. C07d *55/52*

U.S. Cl. 260—248.5 **8 Claims**

Organic compounds are nitrosylated with nitrous fumes which are essentially free from molecular oxygen, and in which the molar ratio of nitric oxide to nitrogen peroxide is at least 9:1. An advantage of the process is that the product is free from alkali metal salts, so facilitating recovery of the product and re-use of material in the mother liquor. For example, in the production of dinitrosopentamethylenetetramine, by-product formaldehyde can be reconverted into hexamethylenetetramine by adding ammonia, and the mother liquor containing this regenerated hexamethylenetetramine recycled.

3,721,670

3-SUBSTITUTED-AS-TRIAZINO[5,6-c]QUINOLINES

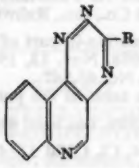
George Carlin Wright and Chia Nien Yu, Norwich, N.Y., assignors to Morton-Norwich Products, Inc.

No Drawing. Filed Apr. 5, 1971, Ser. No. 131,482

Int. Cl. C07d *55/08*

U.S. Cl. 260—248 AS **6 Claims**

Novel 3-substituted-as-triazino[5,6-c]quinolines of the formula:



wherein R is chloro, amino, 2-hydroxyethylamino, methoxy, or diallylamino are useful as antifungal agents.

3,721,671

NOVEL QUINAZOLINONE DERIVATIVES 2-ALKYL-3-(3'-METHYLPYRIDINE-2'-YL)-5-CHLORO-4(3H)-QUINAZOLINONE

Hisao Yamamoto; Shigeho Inaba, both of Nishinomiya; Seitetsu Arasaki; Isamu Maruyama, both of Minoo; Kei Takahashi, Takarazuka; Chiharu Saigo, and Shigeru Sakai, both of Toyonaka, all of Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan

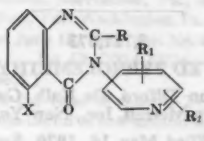
Continuation-in-part of Ser. No. 683,813, Nov. 17, 1967, abandoned. This application May 4, 1970, Ser. No. 34,587

Claims priority, application Japan, Jan. 23, 1967, 42/4725

Int. Cl. C07d *51/48*

U.S. Cl. 260—256.4 Q **3 Claims**

Novel quinazolinone derivatives, which exhibit central nervous system depressing activities such as tranquilizing, sedative, muscle-relaxing, spasmolytic and barbital potentiating activities with low toxicity, having the formula,

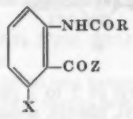


wherein R is hydrogen, lower alkyl or halogenated lower alkyl,

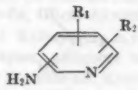
R_1 is hydrogen, halogen, lower alkyl, halogenated lower alkyl, lower alkoxy or nitro,

R_2 is halogen, lower alkyl, halogenated lower alkyl, lower alkoxy or nitro, and

X is chlorine or bromine are prepared by reacting an N-acylanthranilic acid derivative of the formula



wherein R and X have the same meanings as above and Z is hydroxyl, lower alkoxy, halogen or a group —OY where Y is an alkali metal, with an aminopyridine derivative of the formula



wherein R_1 and R_2 have the same meanings as defined above.

3,721,672

SPIRO[CYCLOHEXANE-1,9-THIOXANTHENES]

Helmut Muller-Calgan, Richard Unger, and Hans Joachim Enenkel, Darmstadt, Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany

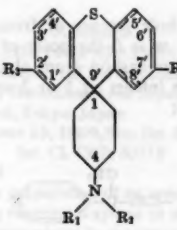
No Drawing. Filed Nov. 13, 1970, Ser. No. 89,489

Claims priority, application Germany, Nov. 15, 1969, P 19 57 490.4

Int. Cl. A61k *27/00;* **C07d** *65/16, 51/66*

U.S. Cl. 260—268 PC **27 Claims**

4 - aminospiro[cyclohexane - 1,9' - thioxanthene] compounds of the formula



wherein R_1 is H or alkyl of 1–6 carbon atoms; R_2 is H or alkyl of 1–3 carbon atoms, or, R_1 and R_2 collectively with the nitrogen atom to which they are attached are a morpholine, pyrrolidine, piperidine or piperazine ring, the latter three can optionally be substituted by a methyl or ethyl group; and R_3 and R_4 each are H or Cl, including the physiologically acceptable acid addition salts and quaternary ammonium salts thereof, have psychotropic

activity, including tranquilizing and thymoanaleptic activity, and blood circulatory stimulating, spasmolytic and antihistaminic activity.

3,721,673

SUBSTITUTED PYRROLEMETHYLAMINES

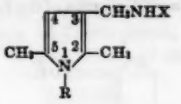
Charles Harmon Tilford, De Kalb, Ga., assignor to Richardson-Merrell, Inc., New York, N.Y.

No Drawing. Filed May 14, 1970, Ser. No. 37,313

Int. Cl. C07d *87/10*

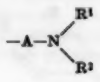
U.S. Cl. 260—268 H **10 Claims**

Disclosed as novel compounds useful as hypotensive and antihypertensive agents are compounds having the formula



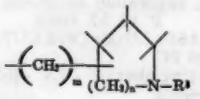
wherein R is cycloalkyl of 5 to 7 carbon atoms, pyridyl, methylpyridyl, quinolyl, phenyl, a mono- or di-substituted phenyl group in which case the substituents may be halogen, (lower)alkyl of 1 to 3 carbon atoms, lower alkoxy of 1 to 4 carbon atoms or di(lower)alkylamino having 1 to 4 carbon atoms in each alkyl group, or aralkyl such as phenethyl or α-methylbenzyl; and X is

(A) The group



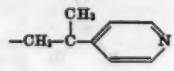
wherein A is a straight or branched alkylene chain of 2 or 6 carbon atoms; R^1 and R^2 may be the same or different and represent hydrogen, alkyl of 1 to 3 carbon atoms, hydroxyalkyl, di(lower) alkylaminoalkyl, cycloalkyl of from 5 to 7 carbon atoms, phenyl, phenyl substituted with (lower)alkyl, or R^1 and R^2 together with the nitrogen atom to which they are attached may be a saturated heterocyclic group such as pyrrolidino, piperidino, morpholino, piperazino or N-(lower alkyl)piperazino,

(B) The group



wherein *m* is a whole integer of from 0 to 3 with the proviso that when *m* is 0 the point of attachment of X may not be at either carbon atom alpha to the nitrogen atom; *n* is a whole integer of 1 or 2 and R^3 is hydrogen or (lower)alkyl; or

(C) The group



and the acid addition salts of said compounds. The novel compounds may be prepared from trisubstituted pyrrolecarboxaldehydes by reaction with primary amines followed by reduction to the corresponding pyrrolemethylamines or by a Mannich type reaction of a trisubstituted pyrrole with a primary or secondary amine and formaldehyde.

3,721,674

PIPERAZINYL ETHYL CARBAMATES

Franklin W. Abbate, North Haven, and William J. Farrissey, Jr., Northford, Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

No Drawing. Filed Mar. 2, 1970, Ser. No. 15,878

Int. Cl. C07d *51/70*

U.S. Cl. 260—268 R **2 Claims**

Piperazinyl ethyl carbamates are obtained in good yield by reacting an N,N-dihydrocarbylcarbamate with triethylenediamine at an elevated temperature. The piperazinyl derivative so formed are useful in the preparation of acid-soluble and acid-dyeable polyurethanes, and as catalysts in the manufacture of polyurethanes.

3,721,675

OXAZOLIDIN-2-ONE DERIVATIVES

Jacques G. Maillard, Paris, France, assignor to Laboratoires Jacques Logeais, Issy-les-Moulineaux, France

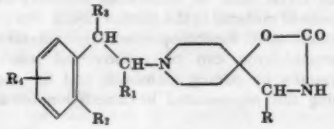
Filed March 19, 1970, Ser. No. 21,188

Claims priority, application France, March 25, 1969, 6908662

Int. Cl. C07d *99/04*

U.S. Cl. 260—293.62 **12 Claims**

The 5-(piperidine-4-spiro)-oxazolidin-2-one derivatives of formula:



(I)

in which R is hydrogen, an alkyl radical or an aryl radical, R_1 is an alkyl radical and R_2 is hydrogen, or R_1 and R_2 form together a methylene or ethylene bridge, R_3 is hydrogen or an alkyl radical and R_4 is hydrogen, halogen, an alkoxy radical or a hydroxy radical, R, R_2 and R_4 not being simultaneously hydrogen, have analgesic and hypotensive properties.

3,721,676

CERTAIN 3-AMINO-2(1H)PYRIDONES

Bruce E. Witzel and Tsung-Ying Shen, Westfield, Patricia M. Graham, Mountainside, Robert L. Clark, Woodbridge, and Arsenio A. Pessolano, Colonia, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

No Drawing. Continuation-in-part of abandoned application Ser. No. 876,058, Nov. 12, 1969. This application June 11, 1970, Ser. No. 45,547

The portion of the term of the patent subsequent to Apr. 4, 1989, has been disclaimed

Int. Cl. C07d *31/42*

U.S. Cl. 260—296 R **10 Claims**

Novel secondary and tertiary aminopyridones useful as antiinflammatory, analgesic and antipyretic agents.

3,721,677

METHOD FOR INVERTING D AND L CONFIGURATIONS OF OPTICALLY ACTIVE ISOMERS OF ASYMMETRICAL ORGANOPHOSPHOROUS COMPOUNDS

Henryy Tolkmith, Midland, Mich.; James N. Seiber, Davis, Calif., and Paul B. Budde, Midland, Mich., assignors to the Dow Chemical Company, Midland, Mich.

Division of Ser. No. 868,595, Oct. 22, 1969, Pat. No. 3,621,031, and a continuation-in-part of Ser. No. 604,153, Dec. 23, 1966, abandoned. This application Dec. 14, 1970, Ser. No. 98,190

Int. Cl. C07f *9/22, 9/44*

U.S. Cl. 260—309 **1 Claim**

Optically active isomers of asymmetrical diamino phosphine sulfides containing a P-imidazolyl radical are resolved and separated.

3,721,678

2-TRIFLUOROMETHYL-OR 2-PENTAFLUOROETHYLBENZIMIDAZOLE

Dennis Ernest Burton, Frog Cottage, South Street, Ickleton, Saffron Walden, Essex; Geoffrey Tattersall Newbold, Glen Orchy, Rookery Lane, Wendens Ambo, Saffron Walden, Essex; Albert Percival, "Northumbria", The Lane, Hauxton, Cambridgeshire; Alan James Lamble, 78 Habberley Road, Kinderminster, Worchestershire, and Ian Robert Sencial, 6 Cleves Drive, Rubery, Worchestershire, all of England

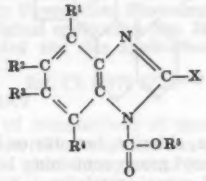
Continuation-in-part of Ser. No. 457,519, May 20, 1965, abandoned. This application April 17, 1967, Ser. No. 631,175

Claims priority, application Great Britain, May 27, 1964, 21,845/64; April 23, 1966, 17,876/66

Int. Cl. C07d *49/38*

U.S. Cl. 260—309.2 11 Claims

The invention provides physiologically active compounds of the formula



wherein the above formula X is selected from the group consisting of trifluoromethyl and pentafluoroethyl, and R^1, R^2, R^3 and R^4 are selected from the group consisting of hydrogen, alkyl, hydroxy, alkoxy, nitro, halogen, pseudo-halogen, substituted alkyl, carboxy, carboxy ester, carboxy amide, N-substituted carboxy amide, N-disubstituted carboxy amide, amino monosubstituted amino, disubstituted amino, thiol, alkylthiol and oxygenated derivatives thereof, sulphonic acid, ester and amide, substituted amide, and a heterocyclic ring attached to the benzimidazole system through a nitrogen atom, radicals and R^5 is selected from the group consisting of alkyl, substituted alkyl, aryl, substituted aryl, cycloalkyl and substituted cycloalkyl radicals. Also disclosed are physiologically active compositions containing the substituted benzimidazole compounds as an active ingredient as well as methods for the treatment of plants, materials, the soil, land or aquatic areas which comprises applying thereon or thereto a physiologically active composition as defined.

3,721,679

1,3-DISUBSTITUTED-2-TRICHLOROMETHYL-5-IMINO-4-IMIDAZOLIDINONES

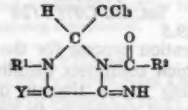
Malcolm Scott Singer, Richmond, Calif., assignor to Chevron Research Company, San Francisco, Calif.

No Drawing. Filed Sept. 3, 1970, Ser. No. 69,466

Int. Cl. C07d *49/30*

U.S. Cl. 260—309.7 6 Claims

Compound of the formula



wherein Y is oxygen or sulfur, R^1 is alkyl of 1 to 8 carbon atoms substituted with 0 to 3 halogen atoms or aryl of 6 to 10 carbon atoms substituted with 0 to 3 halogen atoms, R^2 is hydrogen, R^1, an alkoxy of 1 to 8 carbon atoms or phenoxymethyl substituted with 0 to 3 halogen atoms in the benzene nucleus. The compounds are pesticides and/or herbicides.

3,721,680

5-AROYL-2-(β-HYDROXYETHYL)-1-LOWERALKYL-PYRROLES

John Robert Carson, Norristown, Pa., assignor to McNeil Laboratories, Inc., Fort Washington, Pa.

Filed June 15, 1970, Ser. No. 46,519

Int. Cl. C07d *27/26*

U.S. Cl. 260—326.5 J 6 Claims

Compounds of the class of 5-aroyl-2-(β-hydroxyethyl)-1-loweralkyl-pyrroles useful as anti-inflammatory agents.

3,721,681

PHENYLFURAN-AND PHENYLTHIOPHENE-ALKANOLS AND DERIVATIVES THEREOF

Jonathan Hutton, and Gilbert Joseph Stacey, both of Macclesfield, England, assignors to Imperial Chemical Industries, Limited, London, England

Continuation-in-part of Ser. No. 758,581, Sept. 9, 1968, Pat. No. 3,652,575. This application Aug. 26, 1971, Ser. No. 175,402

Int. Cl. A61k *27/00*; C07d *5/16, 63/12*

U.S. Cl. 260—332.3 R 2 Claims

This invention relates to new heterocyclic compounds, and more particularly to new phenyl-heterocyclic-alkanol derivatives, which have anti-inflammatory, analgesic and antipyretic activity.

3,721,682

MANUFACTURE OF BENZYLIDENE SORBITOLS

Koichi Murai, Kyoto-fu; Giichi Akazome, Kyoto; Yasuo Choshi, Uji; Toshiaki Kobayashi, Kyoto, and Atsuo Tsuji, Kyoto-fu, all of Japan, assignors to New Japan Chemical Company Limited, Fushimi-ku, Kyoto-shi, Japan

Filed Oct. 5, 1970, Ser. No. 78,207

Int. Cl. C07d *13/04, 15/04*

U.S. Cl. 260—340.7 6 Claims

In reacting an aqueous solution of sorbitol with benzaldehyde in the presence of a dehydrating catalyst to produce a benzylidene sorbitol, a method of this invention comprises adding cyclohexane to the reaction system in an amount of five to 20 weight parts based on one weight part of the benzaldehyde, heating with stirring the reaction system to effect the reaction between sorbitol and benzaldehyde while boiling an azeotropic mixture of cyclohexane and water, said azeotropic mixture being condensed and separated to remove the water from the reaction system and recycle the cyclohexane to the system, and recovering the resultant benzylidene sorbitol thus produced.

3,721,683

PROCESS FOR THE PREPARATION OF AROMATIC CARBOXYLIC ANHYDRIDES

Ryoichi Yokoyama, Hiroshima-ken, Japan, assignor to Teijin Chemicals Limited, Tokyo, Japan

Filed June 13, 1969, Ser. No. 833,191

Int. Cl. C07c *63/18*

U.S. Cl. 260—346.4 10 Claims

A process for the preparation of an aromatic carboxylic anhydride comprising reacting o-xylene or durene with molecular oxygen in the vapor phase, in the presence of a solid oxidation catalyst, which is characterized in that the solid oxidation catalyst in that obtained by calcining, at temperatures not lower than 560°C., a mixture of a vanadium compound, a chromium compound and a promotor metal component selected from the group consisting of tin plus antimony, germanium, tin plus indium, niobium, tantalum, gallium and zirconium, the atomic ratio of vanadium to chromium in the catalyst being within the range of 1: 0.5~1 : 1.

3,721,684

RABELOMYCIN

Edward Meyers, East Brunswick; Dorothy Smith Slusarchyk, Belle Mead; Wen-chih Lui, Princeton Junction, and William Lawrence Parker, North Brunswick, all of N.J., assignors to E. R. Squibb & Sons, Inc., New York, N.Y.

Filed June 18, 1970, Ser. No. 47,479
Int. Cl. C07c *49/74*
U.S. Cl. 260—365 4 Claims

The antibiotic rabelomycin is obtained by the cultivation, under controlled conditions, of *Streptomyces olivaceus* ATCC 21549. Rabelomycin is active against bacteria.

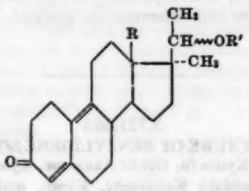
3,721,685

NOVEL 19-NOR $\Delta^{4,9}$-PREGNADIENES

Jean Jolly, Fontenay-sous-Bois, and André Pierdet, Noisy-le-Sec, France, assignors to Roussel-UCLAF, Paris, France

No Drawing. Filed Mar. 1, 1971, Ser. No. 119,891
Claims priority, application France, Mar. 3, 1970, 7007550
Int. Cl. C07c *169/34*
U.S. Cl. 260—397.4 9 Claims

13β-R-17α-methyl-18,19-dinor-$\Delta^{4,9}$-pregnadienes of the formula



I

wherein R is alkyl of 1 to 4 carbon atoms and R' is selected from the group consisting of hydrogen and acyl of an organic carboxylic acid of 1 to 18 carbon atoms having anti-ovulatory activity and their preparation and intermediates thereof.

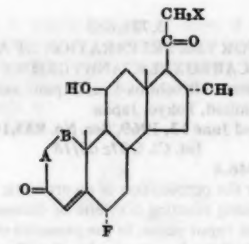
3,721,686

NOVEL 6α-FLUORO-11β-HYDROXY-16α-METHYL-21-HALO-PROGESTERONES

Henry Laurent, Karl Heinz Kolb, and Rudolf Wiechert, Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin, Germany

No Drawing. Filed Feb. 22, 1971, Ser. No. 117,756
Claims priority, application Germany, Feb. 28, 1970, P 20 10 458.9
Int. Cl. C07c *169/34*
U.S. Cl. 260—397.45 10 Claims

21-halo-steroids of the formula



wherein —A—B— is one of the groups —CH_2—CH_2—, —CH=CH—, or —CCl=CH—, and X is a halogen atom, have excellent anti-inflammatory activity, especially topical anti-inflammatory activity, with a low incidence of side effects, e.g., sodium retention and potassium excretion.

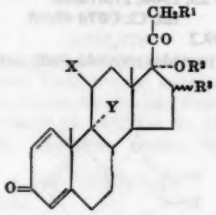
3,721,687

3-KETO-Δ^4 - 9α - HALO - 11 - OXYGENATED-16-METHYL OR METHYLENE- 17α - ACYLOXY-20-KETO-21-HALO PREGNENES

Joseph Elks, London, Gordon Hanley Phillipps, Wembley, and Peter John May, North Harrow, England, assignors to Glaxo Laboratories Limited, Greenford, England

No Drawing. Continuation-in-part of application Ser. No. 792,809, Jan. 21, 1969. This application June 8, 1970, Ser. No. 44,565
Claims priority, application Great Britain, Apr. 4, 1968, 3,100/68
Int. Cl. C07c *160/30*
U.S. Cl. 260—397.45 24 Claims

Anti-inflammatory steroids of the formula



wherein

R^1 is a fluorine, chlorine, bromine or iodine atom,
R^2 is an alkanoyl group containing 1–4 carbon atoms,
R^3 is an alkyl group containing 1–4 carbon atoms or a methylene group (=CH_2),
X is a hydroxy group in the β-configuration or a keto group,
Y is a fluorine or chlorine atom, and
= represents a single or double bond between the 1- and 2-positions of the molecule.

3,721,688

QUATERNARY AMMONIUM SALTS OF 17α-AMINOALKYNYL - 19 - NORSTEROIDAL 3,5-DIENES

Gerhard R. Wendt, Haverton, Kurt W. Ledig, Philadelphia, and Donald W. Oliver, Phoenixville, Pa., assignors to American Home Products Corporation, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 796,909, Feb. 5, 1969. This application Mar. 30, 1970, Ser. No. 24,039
The portion of the term of the patent subsequent to Apr. 20, 1988, has been disclaimed
Int. Cl. C07c *169/20*
U.S. Cl. 260—397.5 6 Claims

Novel biocidal steroidal quaternary ammonium salts have been prepared which are useful as amebicides, tricomonacides, fungicides, bactericides and nematocides.

3,721,689

PROCESS FOR PREPARING ALKYL TITANATES BY TRANSESTERIFICATION

Guy Marie Paul Bardinet, Thann, France, assignor to Fabriques de Produits Chemiques de Thann et de Mulhouse, Thann (Haut-Rhin), France

Filed Apr. 9, 1971, Ser. No. 132,785
Claims priority, application France, Apr. 17, 1970, 7013929
Int. Cl. C07f *7/28*
U.S. Cl. 260—429.5 13 Claims

A transesterification process for the production of an alkyl titanate which comprises distilling under reflux a mixture comprising (a) a titanate of a first alkanol, (b) a second alkanol present in an amount in excess of that required completely to transesterify the titanate of the first alkanol and (c) a quantity of the first alkanol, the boiling point of the second alkanol being higher than the boiling point of the first alkanol, distilling off the first alkanol and the excess quantity of the second alkanol, and recovering from the undistilled residue a titanate of the second alkanol.

3,721,690

WATER REPELLENT COMPOSITIONS OF ORGANOTIN AND ORGANOSILICON COMPLEXES

Otto J. Maltenieks, Marietta, Ga., assignor to Lockheed Aircraft Corp., Burbank, Calif.

Filed July 26, 1971, Ser. No. 166,300
Int. Cl. C07f 7/22
U.S. Cl. 260—429.7 10 Claims

Water repellent compositions of chelated tin-silicon and silicon-mercaptans are disclosed which are useful as water repellent coating materials for both glass or plastic surfaces and for metal or other nontransparent surfaces. The useful lifetime of water repellent coatings made with these compositions permits their use as semi-permanent coatings for windshields, windows, and other surfaces.

3,721,691

DIFLUOROXALATOSTANNATE(II) COMPLEXES

Simon Katz, Indianapolis, Ind., assignor to Indiana University Foundation, Bloomington, Ind.

No Drawing. Original application Jan. 20, 1971, Ser. No. 108,227. Divided and this application Mar. 2, 1971, Ser. No. 231,434
Int. Cl. C07f 7/22
U.S. Cl. 260—429.7 4 Claims

A new genus of compositions of matter, namely, difluoroxalatostannate(II) complexes has been discovered. These compounds when incorporated into oral compositions for dental caries prophylaxis (e.g., as a constituent of a dentifrice, prophylaxis paste, or mouthwash), have demonstrated substantial utility as an anticariogenic agent.

3,721,692

PROCESS OF SEPARATING YTTRIUM FROM LANTHANIDES

Werner Fischer and Felix Schmitt, Hannover, Germany, assignors to Th. Goldschmidt A.G., Essen, Germany

No Drawing. Filed July 22, 1968, Ser. No. 746,298
Int. Cl. C07f 5/00
U.S. Cl. 260—429.2 2 Claims

Process of separating yttrium from lanthanides by solvent extraction, wherein their thiocyanates are distributed between an aqueous phase and an organic solvent phase, the thiocyanate:lanthanide ratio being at the most equal to the equivalent ratio. In accordance with the invention, the distribution is effected at a temperature below room temperature and preferably between +5° C. and the cryohydric point of the aqueous phase.

3,721,693

METAL HALIDE - ESTER REACTION PROCESS AND COMPOSITIONS

Marvin Michael Fein, Westfield, and John James Roderick, Paramus, both of N.J., assignors to Dart Industries, Inc., Los Angeles, Calif.

Filed May 28, 1971, Ser. No. 148,122
Int. Cl. C07f 5/06
U.S. Cl. 260—448 R 13 Claims

New compositions useful as antiperspirants are derived from the reaction of a metal halide Lewis acid with at least one ester selected from pyrocarbonates, carbonates and ortho formates, with or without subsequent further reaction with an organic hydroxyl-containing compound.

3,721,694

FLUOROSULFONATE COMPOUNDS AND METHOD OF THEIR PREPARATION

Claude I. Merrill, Lancaster, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Filed June 13, 1968, Ser. No. 736,863
U.S. Cl. 260—456 A 6 Claims

The invention is to the compounds perfluoroformamidine fluorosulfonate and [tris(fluorosulfonate)methyl] fluorosulfonatofluoroamine and a method for their preparation by reacting perfluoroguanidine and peroxy-disulfuryl difluoride.

3,721,695

TRIS(DIFLUOROAMINO)-METHYL FLUOROSULFONATE

Claude I. Merrill, Lancaster, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Filed June 13, 1968, Ser. No. 736,862
Int. Cl. C07c 143/02
U.S. Cl. 260—456 A 5 Claims

The compound tris(difluoroamino)methyl fluorosulfonate and a method for its preparation by reacting tris(difluoroamino)bromomethane with peroxydisulfuryl difluoride at an elevated temperature.

3,721,696

POLYOXYPERFLUOROMETHYLENE COMPOUNDS AND PROCESS OF THEIR PREPARATION

Dario Sianesi, Giancarlo Bernardi, and Giovanni Moggi, Milan, Italy, assignors to Montecatini Edison S.p.A., Milan, Italy

No Drawing. Continuation of abandoned application Ser. No. 652,000, July 10, 1967. This application Nov. 27, 1970, Ser. No. 93,385
Int. Cl. C07c 51/58, 59/22
U.S. Cl. 260—463 14 Claims

Linear polyethers having the group —COF as a terminal group. Polyethers may be of the formula

$$CF_3O—(CF_2O)_m—COF$$

or $CF_3O—(CF_2O)_n—CF_2—COF$ where m is a whole number from 1 to 100 and n is zero or a whole number from 1 to 100.

3,721,697

RESOLUTION OF DL-α-LOWER ALKANOYLAMINO-α-(BENZYL)PROPIONITRILES

Donald F. Reinhold and Meyer Sletzinger, North Plainfield, and John M. Chemerda, Watchung, N.J., assignors to Merck & Co. Inc., Rahway, N.J.

No Drawing. Division of application Ser. No. 642,272, Apr. 10, 1967, now Patent No. 3,505,385, which is a division of application Ser. No. 309,379, Sept. 19, 1963, now Patent No. 3,366,679, which in turn is a continuation-in-part of application Ser. No. 229,961, Oct. 11, 1962, now abandoned. This application July 9, 1969, Ser. No. 840,462
Int. Cl. C07c 121/78
U.S. Cl. 260—465 D 2 Claims

A process of resolving a DL-α-loweralkanoylamino-α-substituted-benzyl lower alkyl nitrile by forming two saturated solutions and seeding one with the L-isomer and the other with the D-isomer.

3,721,698

1,4-BIS-[TRIS-(NF2)METHOXY]-2,3-DINITROXYBUTANE

Eugene L. Stogryn, Fords; Joel G. Berger, Elizabeth, both of N.J., and David S. Bosniack, New York, N.Y., assignors to Esso Research and Engineering Company

Filed Sept. 3, 1964, Ser. No. 395,110
Int. Cl. C07c 77/02
U.S. Cl. 260—467 6 Claims

1. The compound 1,4-bis-[tris-(NF_2)methoxy]-2,3-dinitroxybutane having the compositional formula:

$$(NF_2)_3COCH_2CH(ONO_2)\,CH(ONO_2)CH_2OC(NF_2)_3.$$

3,721,699

O,N-DIPHENYL-CARBAMIC ACID ESTERS

Walter Traber, Riehen; Heinz Hambock, Binningen, and Anton Georg Weiss, Benken, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jan. 26, 1970, Ser. No. 5,954
Int. Cl. C07c 125/06
U.S. Cl. 260—471 C 9 Claims

Certain O,N-diphenyl-carbamic acid esters in which one phenyl moiety is substituted in the 2-position by a halogenated

phenoxy radical are disclosed as microbicidally active compounds. A method for controlling microorganisms with the aid of such compounds and compositions containing them are also described.

3,721,700
FLUORINATED POLYGLYCOL DERIVATIVES AND THEIR PREPARATION

Erich Schuierer and Dieter Hoffmann, Burghausen, Salzach, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed Aug. 26, 1970, Ser. No. 67,278
Claims priority, application Germany, Sept. 17, 1969, P 19 46 956.8
Int. Cl. C07c *125/06*
U.S. Cl. 260—471 C **11 Claims**

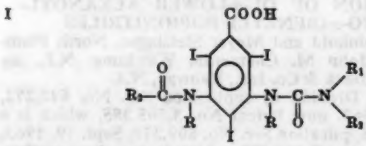
Adducts from fluoroalkanols, toluene diisocyanates and polyethylene glycols are useful for rendering textiles oil- and water repellent and achieve the "soil release effect." Furthermore, they are dispersing agents for oil- and water repellent polymers made of adducts from said fluoroalkanols, toluene diisocyanates and ethylene imine.

3,721,701
RADIOPAQUE TRIIODOALKYLUREIDO BENZOIC ACIDS

Jack Bernstein and Kathryn Alice Losee, New Brunswick, N.J., assignors to E. R. Squibb & Sons, Inc., New York, N.Y.

No Drawing. Filed June 19, 1970, Ser. No. 47,902
Int. Cl. C07c *127/16, 127/18*
U.S. Cl. 260—471 R **6 Claims**

Compounds having the formula



wherein R and R_1 are hydrogen or lower alkyl and R_2 is lower alkyl, as well as salts and lower alkyl esters of these compounds are useful as diagnostic agents.

3,721,702
PROCESS FOR PREPARING DIETHYL 3,4-DI-ALKOXYANILINOMETHYLENEMALONATES

Nicholas D. Harris, Norwich, N.Y., assignor to Morton-Norwich Products, Inc.

No Drawing. Filed July 22, 1968, Ser. No. 746,247
Int. Cl. C07c *101/20*
U.S. Cl. 260—471 A **1 Claim**

Dialkyl anilinomethylenemalonates, useful as intermediates via cyclization to form useful hypotensives and coccidiostats, are prepared by displacement of the dimethylamino group of diethyl dimethylaminomethylenemalonate with an aniline.

3,721,703
PHENOXYALKANE-CARBOXYLIC ACIDS, SALTS AND ESTERS THEREOF

Helmut Nahm, Frankfurt am Main, Germany, and by Helene Elise Siedel, heiress, late of Bad Soden/Taunus, Germany (by Helene Elise Siedel, Heiress), assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister, Lucius & Bruning, Frankfurt am Main, Germany

Filed Jan. 9, 1969, Ser. No. 790,897
Claims priority, application Germany, Jan. 11, 1968, P 16 68 896.3
Int. Cl. C07c *101/44*
U.S. Cl. 260—471 R **12 Claims**

Phenoxyalkane-carboxylic acids with a 4-substituted phenoxy group in para position of the benzene ring, their esters with aliphatic, cycloaliphatic or araliphatic alcohols and their salts with non-toxic bases having a decreasing effect on the serum cholesterol level and a process for their manufacture.

3,721,704
ESTERS OF (DIALKYL-4-HYDROXY-PHENYL)MALONIC ACID AND RELATED COMPOUNDS

Martin Dexter, Briarcliff Manor, N.Y., assignor to Geigy Chemical Corporation, Ardsley, N.Y.

Filed Feb. 17, 1967, Ser. No. 616,801
Int. Cl. C07c *69/76*
U.S. Cl. 260—473 S **12 Claims**

Derivatives of malonic acid substituted with groups containing a hindered phenol are disclosed. A preferred compound is di-n-octadecyl-2,2-bis-(3',5'-di-t-butyl-4'-hydroxybenzyl) malonate. The compounds are stabilizers suitable for stabilizing numerous substrates of organic material subject to oxidative deterioration, in particular polypropylene. Synergistic combinations of these compounds and dialkyl thiodipropionates are disclosed.

3,721,705
PROCESS FOR PRODUCING METHACRYLIC ACID OR ITS ESTERS

Hitoshi Nakajima, Ageoshi; Masazumi Chono, Saitamaken; Masayoshi Taguchi, Itabashiku; Tokio Sakurai, Kawagoe, and Noriaki Matsuo, Itabashiku, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed June 11, 1971, Ser. No. 152,381
Claims priority, application Japan, June 18, 1970, 45/52388; Dec. 15, 1970, 45/111304
Int. Cl. C07c *69/54*
U.S. Cl. 260—486 D **6 Claims**

Methacrylic acid or its esters is produced by reacting one part by mole of isobutyric acid or its esters, for example, methyl isobutyrate, ethyl isobutyrate, propyl isobutyrate and butyl isobutyrate with 0.1 to 30 parts by mole, preferably 0.2 to 1 part by mole of sulfur vapor at a temperature of 300° – 700° C.

3,721,706
PERFLUORO-ALKYL-ALKYLENE-SULFONAMIDO-ALKYLENE-DIALKYLAMINES AND THEIR QUATERNARY AMMONIUM SALTS

Dieter Hoffmann, Burghausen, Salzach, Germany, and Hans Stach, Sao Paulo, Brazil, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed Mar. 17, 1971, Ser. No. 125,352
Claims priority, application Germany, Mar. 19, 1970, P 20 13 104.8
Int. Cl. C07c *101/24*
U.S. Cl. 260—501.12 **6 Claims**

Partially fluorinated paraffin sulfonic acid amides having in their amide moiety an alkylene group with a terminal tertiary amino group or a quaternary ammonium group are obtained by reacting a partially fluorinated paraffin sulfochloride with an N,N-dialkyl-alkylenediamine and, optionally, transforming the so-obtained sulfonic acid amides into their salts with acids or quaternizing agents. The products are useful as surface- or interface-active agents, especially as emulsifiers or foaming agents.

3,721,707
ORGANIC SULFONIC ACID OLIGOMERS AND PRODUCTION PROCESS

Alan E. Straus, El Cerrito, William A. Sweeney, Larkspur, Ralph House, El Sobrante, and Samuel H. Sharman, Kensington, Calif., assignors to Chevron Research Company, San Francisco, Calif.

No Drawing. Filed Sept. 15, 1969, Ser. No. 858,097
Int. Cl. C07c *143/02*
U.S. Cl. 260—513 **22 Claims**

Organic disulfonic acids are produced by heating a sulfonate monomer at a temperature above 110° C. in

the substantial absence of water. Olefin sulfonation product mixtures, hydroxyalkane sulfonic acids, alkane sultones, alkene sulfonic acids and mixtures thereof are oligomerized under these conditions.

3,721,708

PROCESS FOR THE PREPARATION OF o-PHTHALIC ACID

Ferdinand List, Johann Dodt, and Helmut Alfs, Marl, Germany, assignors to Chemische Werke Huels, A.G., Marl, Germany

No Drawing. Filed Dec. 11, 1969, Ser. No. 884,371

Claims priority, application Germany, Dec. 14, 1968, P 18 13 707.4

Int. Cl. C07c *63/02, 63/18*

U.S. Cl. 260—524 R **10 Claims**

The preparation of phthalic acid by the oxidation of o-xylene in the presence of a carboxylic acid and a bromine compound is improved by conducting the oxidation in the presence of phthalic anhydride to react with at least some of the water of the reaction, thereby reducing the heat energy required to remove the water from the reaction mixture.

3,721,709

SUBSTITUTED BENZANILIDES

Albrecht Mueller, Frankenthal, Hans Osieka, Ludwigshafen, and Ernst-Heinrich Pommer, Limburgerhof, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

No Drawing. Filed May 24, 1971, Ser. No. 146,449

Int. Cl. C07c *103/30*

U.S. Cl. 260—558 D **4 Claims**

New and valuable substituted benzanilides having a good fungicidal action and a process for controlling fungi with these compounds.

3,721,710

SUBSTITUTED ANILIDES

John Krapcho, Somerset, N.J., assignor to E. R. Squibb & Sons, Inc., New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 808,351, Mar. 18, 1969, which is a continuation-in-part of application Ser. No. 414,838, Nov. 30, 1964. This application May 7, 1971, Ser. No. 141,399

Int. Cl. C07c *103/34*

U.S. Cl. 260—562 R **2 Claims**

Disclosed herein are novel anilide derivatives useful as central nervous system depressants.

3,721,711

CYCLOALKANE CARBOXALDOXIME CARBAMATES

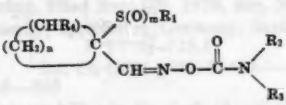
Lester L. Maravetz, Westfield, N.J., assignor to Esso Research and Engineering Company

Filed April 29, 1970, Ser. No. 33,059

Int. Cl. C07c *131/02*

U.S. Cl. 260—566 AC **5 Claims**

Chemical compounds useful as pesticides and characterized by the following structure:



wherein R_1 is C_1—C_4 alkyl and R_2, R_3 and R_4 are the same or different and are hydrogen or C_1—C_4 alkyl; *n* is 1 to 6 and *m* is 0, 1 or 2.

3,721,712

AMINOALKOXY- OR AMINOMETHYL-TRIARYLALKENONES

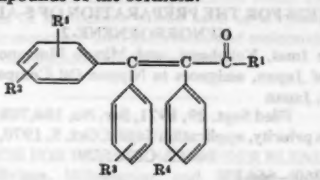
Frank P. Palopoli and Harvey D. Benson, Cincinnati, Ohio, assignors to Richardson-Merrell Inc., New York, N.Y.

No Drawing. Original application Aug. 19, 1968, Ser. No. 753,741, now Patent No. 3,634,517. Divided and this application Mar. 25, 1971, Ser. No. 128,200

Int. Cl. C07c *93/06*

U.S. Cl. 260—570 R **6 Claims**

Novel compounds of the formula:



wherein R^1 is lower alkyl; each of R^2, R^3, and R^4 is hydrogen, lower alkyl, halogen, hydroxy, lower alkoxy, diloweralkylaminoloweralkoxy or trifluoromethyl; and R^5 is hydrogen, lower alkyl, or diloweralkylaminomethyl, provided that when R^5 is diloweralkylaminomethyl R^2 is hydroxy in the para-position of said benzene ring and the diloweralkylaminomethyl is ortho to said hydroxy group; and pharmacologically acceptable, non-toxic acid addition salts of the basic compounds. These compounds possess estrogenic, anti-estrogenic and anti-inflammatory activities.

3,721,713

PROCESS FOR OBTAINING 2,4,7-TRINITROFLUORENONE

Albert Bloom, Boston, Mass., assignor to Industrial Dyestuff Company, East Providence, R.I.

Filed April 10, 1970, Ser. No. 27,446

Int. Cl. C07c *49/76*

U.S. Cl. 260—590 **10 Claims**

2,4,7-trinitrofluorenone, prepared by nitrating fluorenone with a mixture of nitric and sulfuric acids, without refluxing, is obtained in high purity by addition of water to the reaction mass thereby precipitating it from solution while leaving dissolved isomers and other nitration products.

3,721,714

DECOMPOSITION OF CARBONATES TO FORM ALDEHYDES

Donald M. Fenton, Anaheim, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

No Drawing. Filed Dec. 23, 1968, Ser. No. 786,426

Int. Cl. C07c *45/00*

U.S. Cl. 260—601 R **11 Claims**

A process for the preparation of aldehydes and alcohols comprising contacting a dicarbohydryl carbonate with a catalyst comprising a complex of a Group VIII noble metal and a biphyllic ligand at a temperature between 150° C. and 250° C. and at a pressure sufficient to maintain liquid phase reaction conditions. The aldehyde and alcohol products produced are useful as intermediates for a variety of products including plasticizers, acids and resins, etc.

3,721,715

ALKYLATION OF CONDENSED RING ARYLOLS

Donald M. Fenton, Anaheim, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

No Drawing. Filed Dec. 10, 1970, Ser. No. 97,032

Int. Cl. C07c *37/12*

U.S. Cl. 260—624 C **11 Claims**

Condensed ring arylols can be alkylated with an alkyl or cycloalkyl amine in the presence of a Group VIII noble metal catalyst complexed with a biphyllic ligand. A typical embodiment comprises the alkylation of naphthol

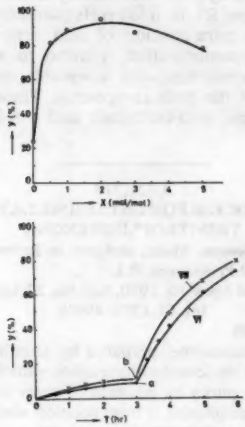
with butylamine in the presence of a complex of ruthenium of triphenylphosphine in liquid phase under refluxing conditions and at atmospheric pressure. Preferably, the reaction is run under basic conditions and, if desired, elevated temperatures and pressures sufficient to maintain liquid phase conditions can be employed. The resulting products are useful as antioxidants or as intermediates in the manufacture of dyes and perfumes.

3,721,716

PROCESS FOR THE PREPARATION OF 5-ALKYLIDE NENORBORNENE-2

Hirosuke Imai, Yokohami, and Mitsuo Matsuno, Kawasaki, both of Japan, assignors to Nippon Oil Company Limited, Tokyo, Japan

Filed Sept. 29, 1971, Ser. No. 184,708
Claims priority, application Japan, Oct. 5, 1970, 45/86909
Int. Cl. C07c *5/24*
U.S. Cl. 260—666 PV **8 Claims**



A process is disclosed for the preparation of 5-alkylidenenorbornene-2 for use as an important component of EPDM rubber. This product is obtained by the isomerization of 5-alkenylnorbornene-2 which is accelerated by the catalytic action of certain complexes. These complexes are formed by combining organic alkalimetal compounds with alkylene diamines.

3,721,717

DISPROPORTIONATION OF TOLUENE OR XYLENE

George Suld, Springfield, and Ralph L. Urban, Newtown Square, Pa., assignors to Sun Oil Company, Philadelphia, Pa.

No Drawing. Filed Dec. 17, 1970, Ser. No. 99,280
Int. Cl. C07c *3/62*
U.S. Cl. 260—672 T **4 Claims**

Disproportionation of toluene or xylenes to benzene and various alkyl substituted benzenes using as catalyst a silica:alumina mole sieve catalyst having a silica: alumina ratio of from 12 to 20:1. The reaction is carried out at from 250 to 500° C. and a pressure of atmospheric up to 70 atm. Preferably, the catalyst is promoted with from 0.1 to 1.0 weight percent of Cr^{3+} ions.

3,721,718

CONVERSION OF OLEFINS USING COMPLEXES OF Fe, Ru, Os, Rh OR Ir WITH ORGANOALUMINUMS

William B. Hughes, and Ernest A. Zuech, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 810,021, March 24, 1969, Pat. No. 3,558,517, which is a continuation-in-part of Ser. No. 717,025, March 28, 1968, abandoned, which is a continuation-in-part of Ser. No. 696,109, Jan. 8, 1968, abandoned, which is a continuation-in-part of Ser. No. 635,688, May 3, 1967, abandoned. This application Sept. 17, 1970, Ser. No. 73,232
Int. Cl. C07c *3/62*
U.S. Cl. 260—683 D **20 Claims**

A process for the conversion of olefinic hydrocarbons according to the olefin reaction (e.g., the olefin disproportionation reaction) by contacting the olefinic hydrocarbon with a catalyst comprising a compound of ruthenium, iron, osmium, rhodium, cobalt or iridium complexed with a selected complexing agent (e.g., triphenylphosphine) and combined with an organoaluminum compound (e.g., methylaluminum sesquihalide). A process of preparing rhodium and iridium NO-containing complexes is described. Metal complexes which contain both NO and NO_2 complexing agents are also described.

3,721,719

PROCESS FOR CONVERTING ETHYLENE TO NORMAL ALPHA OLEFINS

Herbert B. Fernald, Glenshaw, Pa.; Donald E. Hillier, Jr., Baytown; Charles F. Hughes, Jr., Houston, and John R. Strausser, Baytown, all of Tex., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Aug. 27, 1970, Ser. No. 67,624
Int. Cl. C07c *3/10*
U.S. Cl. 260—683.15 D **1 Claim**

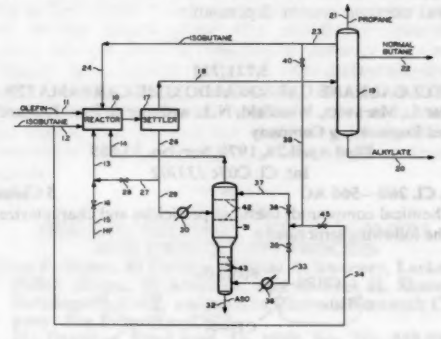
In a process wherein an ethylene stream containing ethane is treated with an aluminum hydrocarbon to obtain a product predominating in normal alpha olefins, the improvement which involves substantially reducing the ethane content of the ethylene stream in order to improve catalyst efficiency, reactor efficiency and reactor productivity.

3,721,720

PURIFICATION OF HF CATALYST IN ALKYLATION PROCESS

Charles C. Chapman, William F. Cannady, and Joe Van Pool, Bartlesville, Okla., assignors to Phillips Petroleum Company

Filed Jan. 25, 1971, Ser. No. 109,165
Int. Cl. C07c *3/54*
U.S. Cl. 260—683.48 **5 Claims**



Olefins and isoparaffins are alkylated in the presence of an HF catalyst. The reactor effluent is passed to a settling zone. The hydrocarbon phase is fractionated to

recover an alkylate product. The acid phase is recycled to the reactor. A portion of the recycled acid is passed to a purification column for removal of acid soluble oil. Stripping vapor and reflux liquid are passed to the purification column in specific ratios to remove a substantial amount of the HF from the acid soluble oil.

3,721,721

METHOD OF ETHYLENE POLYMERIZATION

Kenichi Maemoto, Takatsuki, Takezo Sano, Ibaragi, and Akio Kobayashi, Toyonaka, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

No Drawing. Filed Apr. 15, 1971, Ser. No. 134,440
Claims priority, application Japan, Apr. 21, 1970, 45/34,453
Int. Cl. C08f *1/56, 3/06*
U.S. Cl. 260—85.3 15 Claims

An ethylene polymer having optional molecular weight distribution from narrow to broad is easily produced in good slurry state, in high solvent efficiency and in high catalyst efficiency, by polymerizing ethylene alone or together with other unsaturated hydrocarbon in the presence or absence of hydrogen, using a catalyst comprising (1) as a first component a substance prepared by a method which comprises reacting a vanadium compound with a phosphoric acid and/or its derivative, treating the reaction product with an alcohol, separating from the alcohol-treated product an alcohol soluble product in the form of a solid and adding 1 to 20% by weight of water to said solid alcohol soluble product and (2) as a second component a substance composed mainly of an organo-aluminum compound having the formula,

$$R_nAlX_{3-n}$$

wherein R is a hydrocarbon group having 1 to 8 carbon atoms; X is a halogen atom, an alkoxy group or a hydrogen atom; and n is a positive number of 3 or less.

3,721,722

THICKENABLE UNSATURATED POLYESTER RESIN SYSTEM

Melvin E. Baum, Monroeville, Pa., assignor to Koppers Company, Inc.

Continuation of application Ser. No. 671,849, Sept. 29, 1967. This application July 16, 1970, Ser. No. 56,236
Int. Cl. C08f *21/02, 43/08*
U.S. Cl. 260—862 1 Claim

An unsaturated polyester resin capable of being chemically thickened comprises: (1) an unsaturated polyester; (2) a copolymerizable vinyl aryl monomer; (3) a polymerizable vinyl ether and (4) an acrylonitrile-zinc chloride complex. The polyester resin is chemically thickened by the polymerization of the vinyl ether which is catalyzed by the acrylonitrile-zinc chloride complex. The polyester resin is, therefore, thickened before the initiation of the vinyl copolymerization between the unsaturated polyester and the copolymerizable vinyl aryl monomer.

3,721,723

STORABLE PHOTOSENSITIZED POLYESTER MOLDING AND COATING COMPOSITIONS

Klaus Heidel, Marl, Germany, assignor to Chemische Werke Huls Aktiengesellschaft, Marl, Germany

No Drawing. Filed Sept. 10, 1970, Ser. No. 71,277
Claims priority, application Germany, Sept. 10, 1968, P 19 45 725.1
Int. Cl. C08f *1/00, 21/00*
U.S. Cl. 260—865 12 Claims

The storage stability in the dark of polyester prepolymer compositions curable by ultraviolet radiation by the presence therein of a benzoin photosensitizer is improved by incorporating an organophosphite therein.

3,721,724

RUBBER MODIFIED OLEFINIC NITRILE-VINYL AROMATIC-MALEIMIDE INTERPOLYMERS

Curtis E. Uebele, Bedford; Russell K. Griffith, Chagrin Falls, and Irving Rosen, Painesville, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Sept. 22, 1970, Ser. No. 74,290
Int. Cl. C08f *19/08, 1/13, 5/00*
U.S. Cl. 260—880 R 8 Claims

Interpolymers having high impact strength, high softening temperature and other excellent properties result from the polymerization of an olefinic nitrile such as acrylonitrile, a vinyl aromatic monomer such as styrene, and maleimide in the presence of a conjugated diolefin elastomer.

3,721,725

PROCESS FOR PREPARING POWDER BLENDS

Angelis R. Briggs, Wilmington, and Thomas J. Maxwell, Newark, both of Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 14, 1970, Ser. No. 63,942
Int. Cl. B01j *2/06*
U.S. Cl. 264—6 14 Claims

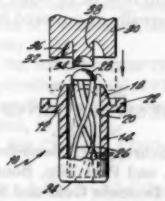
A method of making a homogeneous solid particulate blend of solid initial ingredients involves dissolving in an aqueous solvent a sugar that is sublimable to dryness, a lesser amount of a biological product, and, if the biological product is not sufficiently lubricative, a lubricant; spraying this solution into boiling dichlorodifluoromethane or other fluorocarbon refrigerant; and lyophilizing the resulting frozen droplets. The sugar is usually either mannitol, maltose, lactose, inositol or dextran, or combinations of these sugars. Other sugars in an amount less than the above sugars may also be added to the solution. Less than about 5 percent w/v of an electrolyte may beneficially be added to the solution, as well as other substances, such as acid, base, etc. Ultrasonic waves applied to the fluorocarbon refrigerant in the region where the solution is sprayed increases the freezing rate. Limiting the distribution of sizes of those particles to be tabletted increases the weight homogeneity of the resulting tablets.

3,721,726

METHOD OF MAKING AN INTEGRALLY MOLDED APPLICATOR AND VALVE THEREFOR

Gilbert Schwartzman, 20 Wilmont Circle, Scarsdale, N.Y.

Filed Feb. 16, 1971, Ser. No. 115,398
Int. Cl. B29c *17/00*
U.S. Cl. 264—249 3 Claims



A method of forming a fluid applicator comprising a retainer ring having a projecting portion provided with an opening therein and having a tapered flange surrounding the opening. Integral with the retainer ring is a valve assembly including a valve head and helical springs. The applicator is made through the steps of a one-piece molding after which the valve head is shaped and finished simultaneously with the swaging of a tapered flange to form a valve seat. Thereafter, the projecting portion in the form of a squeezeable container is filled and has its end crimped.

3,721,727

ELECTRIC FURNACE METHOD OF BENEFICIATING TANTALUM-AND NOIBIUM-CONTAINING TIN SLAGS AND THE LIKE

Robert A. Gustison, Reading, Pa., assignor to Kawecki Berylco Industries, Inc., New York, N.Y.

Filed Sept. 9, 1971, Ser. No. 179,191
Int. Cl. C22b 59/00
U.S. Cl. 423—62 6 Claims

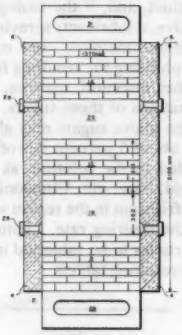
Tin slags containing recoverable amounts of tantalum and niobium are beneficiated with respect to these components by subjecting the slag first to a carbiding treatment followed by a two-stage oxidation treatment in the first stage of which a metal oxide is used to selectively oxidize carbided components of the slag other than the tantalum and niobium and in the second stage of which the carbided tantalum and niobium are re-oxidized to form a product slag which can be substituted for tantalum and niobium ores in methods for the recovery of these metals.

3,721,728

FURNACE HAVING CYCLICALLY MOVING FLAMES

Wayne E. Luetzelschwab, Littleton, Colo., assignor to Marathon Oil Company, Findlay, Ohio

Filed Sept. 13, 1971, Ser. No. 179,706
Int. Cl. F23n 1/02
U.S. Cl. 432—26 11 Claims



By cycling the pressure of fuel gases which impinge upon an air or other oxygen-containing stream directed at an angle to the fuel gases, the gas jet pattern can be caused to sweep across the combustion zone in a furnace, e.g., a Wulff regenerative furnace. This cyclic motion varies penetration and evens out heat distribution. The cyclic changes in pressure can be accomplished by rotating members presenting varying cross-sectional areas to flow or by other devices all of which may be powered externally or powered by the energy of the flowing stream.

3,721,729

PROCESS FOR THE SEPARATION OF CADMIUM AND NICKEL

Karl-Heinz Schulte-Schrepping, Bonn-Beuel; Lothar Kaufmann, Hennf/Sieg, and Paul Tilp, Bonn-Beuel, all of Germany, assignors to Deutsche Gold-und Silber Scheideanstatt vormals Roessler, Frankfurt, Main, Germany

Filed Oct. 15, 1970, Ser. No. 81,184
Claims priority, application Germany, Jan. 17, 1970, P 20 01 985.6
Int. Cl. C01g 53/04
U.S. Cl. 423—105 13 Claims

Cadmium and nickel are separated from an aqueous solution of their salts, which solution contains not over 200 grams per liter of cadmium and nickel, by adding ammonia, precipitating the cadmium as the carbonate with alkali carbonate, and heating the filtrate with alkali hydroxide to precipitate nickel as the hydroxide. The amount of ammonia depending on the amount of nickel in the range of 10 to 100 grams of nickel per liter is varied between 8 and 4 moles per liter.

3,721,730

ALUMINA RECOVERY FROM RETORTED OIL SHALE RESIDUE

Frank C. Haas, Arvada, Colo., assignor to The Oil Shale Corporation, New York, N.Y.

Filed Dec. 30, 1970, Ser. No. 102,930
Int. Cl. C01f 7/34, 7/14
U.S. Cl. 423—119 6 Claims

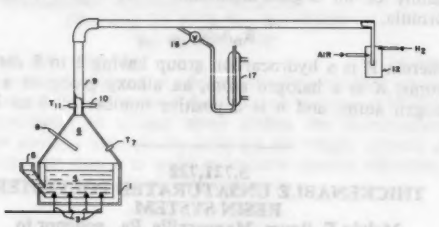
Alumina is recovered from a dawsonite-bearing oil shale matrix by treatment of the retorted oil shale residue or spent shale containing fixed carbon with a dilute aqueous soda ash-caustic soda leach liquor having a concentration of from about 5 to about 20 grams per liter of soda ash and from about 8 to about 20 grams per liter of caustic soda in a mole ratio of soda ash to caustic soda of from about 0.1:1 to about 0.9:1 to provide ultimately a high yield of cell-grade alumina substantially free of silica contamination.

3,721,731

ALUMINUM TRICHLORIDE PRODUCTION

Louis S. Belknap, Hingham, Mass., assignor to Cabot Corporation, Boston, Mass.

Continuation-in-part of Ser. No. 840,705, July 10, 1969, abandoned. This application Oct. 23, 1070, Ser. No. 83,323
Int. Cl. C01f 7/62, 7/58, 7/30
U.S. Cl. 423—264 4 Claims



There is provided a process for the production of aluminum trichloride substantially free from elemental aluminum color impurity. The aluminum trichloride product formed in accordance with the process is especially useful as a feedstock in the further production of white aluminum oxide by vapor phase hydrolysis thereof. Broadly, the process of the invention involves direct primary chlorination of a molten aluminum pool and the injection of further amounts of secondary chlorine into the vaporous effluent from said pool.

3,721,732

METHOD OF MANUFACTURING FILAMENTARY BODIES OF CIRCULAR CROSS-SECTION CONSISTING OF SILICON CARBIDE SINGLE CRYSTALS AND FILAMENTARY BODIES OBTAINED BY SAID METHOD

Wilhelmus Franciscus Knippenberg and Gerrit Verspui, Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation-in-part of application Ser. No. 690,005, Dec. 12, 1967. This application Mar. 7, 1968, Ser. No. 711,349
Claims priority, application Netherlands, Mar. 8, 1967, 6703609
Int. Cl. C01b 31/36; B01j 17/32, 17/00
U.S. Cl. 423—346 7 Claims

A method of manufacturing filamentary bodies of silicon carbide having a circular cross-section in which iron

is heated on a substrate to a temperature between 1150 and 1230° C. while gaseous compounds containing silicon and carbon are decomposed over the substrate and the silicon carbide thus formed absorbed by the iron droplets which become supersaturated and deposit the silicon carbide which is formed as a filamentary body having a circular cross-section.

3,721,733

ANTI-MICROBIAL COMPOSITIONS CONTAINING HISTAMINASE

Gerrit Hendrik van Leeuwen, Soesterengweg 2–4, Soestdijk, Netherlands

No Drawing. Continuation of application Ser. No. 827,151, May 23, 1969. This application Oct. 4, 1971, Ser. No. 186,546

Claims priority, application Netherlands, Oct. 24, 1968, 6815177

Int. Cl. A61k *19/00*

U.S. Cl. 424—94 **3 Claims**

The present invention provides for the addition to antimicrobial compositions the enzyme histaminase. In addition to histaminase, other enzymes such as lypase, proteinase, peptidase and/or chondrosulphatase or admixtures of the same may be added to the composition. Other embodiments include the addition to the basic antimicrobial, histaminase composition of cystein-oxidase or glutaminase. It is preferable that the composition be prepared as a sterile, injectable composition in an ampoule.

3,721,734

METHOD OF TREATING PROSTATIC HYPERTROPHY

Harry W. Gordon, New York, N.Y., assignor to Julius Schmid Inc., New York, N.Y.

Division of Ser. No. 70,509, Sept. 8, 1970, which is a continuation-in-part of Ser. No. 544,712, April 25, 1966, abandoned, and a continuation of Ser. No. 623,847, March 17, 1967, Pat. No. 3,584,118. This application Oct. 29, 1971, Ser. No. 194,052

Int. Cl. A61k *21/00*

U.S. Cl. 424—278 **3 Claims**

Orally administered compositions for treating prostatic hypertrophy are described herein, these compositions containing an effective dose of a pharmaceutical formulation comprising filipin, a polyenic macrolide. Also the method of treating prostatic hypertrophy with such compositions, is described herein.

3,721,735

COMPOSITIONS FOR AND METHOD OF LOWERING CHOLESTEROL LEVELS

Charles A. Thiffault, 3078 Avenue de la Promenade, Ste. Foy, Quebec, Canada

No Drawing. Filed July 15, 1970, Ser. No. 55,254

Int. Cl. A61k *27/00*

U.S. Cl. 424—195 **2 Claims**

There is disclosed a method for lowering the cholesterol levels of humans suffering from hyperlipidemia and associated conditions comprising the administering thereto of effective doses of lignin. Suitable pharmaceutical compositions of lignin are also disclosed.

3,721,736

CERTAIN PHOSPHATES AND THEIR UTILIZATION AS FUNGICIDES

Hironari Sugiyama, Shimizu, Eiichi Yoshinaga, Fujieda, and Hideo Itoh, Shimizu, Japan, assignors to Kumiai Chemical Industry Co., Ltd., Tokyo, Japan

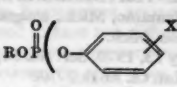
No Drawing. Filed July 6, 1970, Ser. No. 52,679

Claims priority, application Japan, July 10, 1969, 44/54,151

Int. Cl. A01n *9/36*

U.S. Cl. 424—217 **6 Claims**

A method controlling and killing fungi, insects and mites in agriculture and horticulture by using a lethally effective amount of the compound of the formula



wherein R is an alkyl group substituted with at least one of the groups selected from the group consisting of halogen atom, cyano group, thiocyano group and alkoxy group, X is selected from the group consisting of hydrogen atom, halogen atom and alkyl group and *n* is an integer of 1 to 5, in combination with an inert carrier.

3,721,737

2',5'-DIHALO-3-TERT.ALKYL-5-NITROSALICYLANILIDES FOR COMBATTING LEPIDOPTERA CHEWING LARVAE

Walter A Darlington, St. Louis, and John P. Chupp, Kirkwood, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Nov. 15, 1968, Ser. No. 776,276

Int. Cl. A01n *9/20*

U.S. Cl. 424—230 **5 Claims**

Compounds having a 2', 5'-dihalo-3-tert.alkyl-5-nitrosalicylanilido nucleus useful in combatting chewing insect larvae species of the order Lepidoptera, particularly species of the family Noctuidae.

3,721,738

TREATMENT AND PROPHYLAXIS OF THROMBOVASCULAR DISEASES WITH 2-IMIDAZOLONE DERIVATIVES

William D. Cash, Riverside, Conn., and Murray Weiner, White Plains, N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 14, 1971, Ser. No. 143,666

Int. Cl. A61v *27/00*

U.S. Cl. 424—273 **2 Claims**

A method for treating and preventing thrombovascular diseases in warm-blooded animals by administration of an effective amount of a 1,4-dialkyl-5-phenyl-2-imidazolone, such as for example, 1,4-dimethyl-5-phenyl-2-imidazolone.

3,721,739

IMIDAZOLIDINONE DERIVATIVES IN A COMPOSITION AND METHOD FOR PRODUCING C.N.S. DEPRESSANT EFFECTS

Walter Schindler, Riehen, near Basel, and Armin Zust, Birsfelden, near Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 832,011, June 10, 1969, Pat. No. 3,646,039. This application Sept. 22, 1971, Ser. No. 182,878

Claims priority, application Switzerland, June 20, 1968, 9211/68; Dec. 23, 1968, 19149/68

Int. Cl. A61k *27/00*

U.S. Cl. 424—250 **2 Claims**

1-(2- or 1-[3-[4-(4,5-Dihydrothieno[2,3-b][1] benzothiepin-4-yl)-1-piperazinyl]-alkyl]-3-alkyl-2-imidazolidinones and the pharmaceutically acceptable acid addition salts thereof which compounds exhibit depressant activity on the central nervous system; pharmaceutical compositions comprising these compounds and their salts as aforesaid and methods of producing central nervous system depressant effects in mammals which comprise administering an effective amount of a compound according to the invention or a pharmaceutically acceptable acid addition salt thereof; an illustrative embodiment is 1-[2-[4-(4,5-dihydrothieno[2,3-b][1] benzothiepin-4-yl)-1-piperazinyl]-ethyl]-3-methyl-2-imidazolidinone.

3,721,740

ANTHELMINTIC METHOD AND FORMULATIONS EMPLOYING PHENYLHYDRAZONE DERIVATIVES

Sylvester D. Folz, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed July 13, 1970, Ser. No. 54,621

Int. Cl. A61k 27/00

U.S. Cl. 424—327 34 Claims

Certain new ar or ar' (alkylthio) benzoyl chloride phenylhydrazones have been found to be effective, broad-spectrum anthelmintics for suppressing parasitic worms in animals particularly sheep. The method of using the new compounds and new anthelmintic formulations are described. The new compound p-(methylthio)benzoyl chloride phenylhydrazone is effective at rates at least as low as 100 mg. per kilogram of body weight in sheep. The compounds are readily prepared by conventional chemical reactions.

3,721,741

COMBATTING PHYTOPATHOGENIC FUNGI ON PLANTS WITH SUB-PHYTOLOXIC FUNGICIDALLY EFFECTIVE AMOUNTS OF HERBICIDAL N-PHENYL DERIVATIVES OF 3,5-DIHALO-SALICYLALDEHYDE

Otto Rohr, Therwil; Ludwig Ebner, Stein/Ag.; Volker Dittrich, Basle, and Heinz Siegle, Binningen, all of Switzerland, assignors to Ciba-Geigy AG, Basle, Switzerland

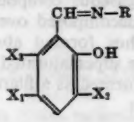
Division of Ser. No. 31,868, April 1, 1970, Pat. No. 3,652,770, which is a continuation of Ser. No. 677,760, Oct. 24, 1967, abandoned. This application Oct. 4, 1971, Ser. No. 186,497

Claims priority, application Switzerland, Oct. 28, 1968, 15711/68

Int. Cl. A01n 9/20

U.S. Cl. 424—330 5 Claims

A preparation for combating harmful insects, acarides, nematodes phytopathogenic fungi and bacteria, which comprises, as active substance, a compound of general formula



wherein X_1 and X_2 represent halogen atoms, X_3 represents a hydrogen or a halogen atom and R represents the hydroxyl group or an aryl or an aralkyl residue which is substituted by at least one member selected from the group consisting of a halogen atom, the CF_3 NO_2, CN, alkyl, alkoxy, SCN and a tertiary amino group, together with a carrier. If desired, there may be present one or more of the following additives: a carrier, a solvent, a dilvent, a dispersing agent, a wetting agent, an adhesive, a fertilizer or other pesticides.

3,721,742

ANTHELMINTIC METHOD AND FORMULATIONS EMPLOYING PHENYLHYDRAZONE DERIVATIVES

Sylvester D. Folz, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed July 13, 1970, Ser. No. 54,619

Int. Cl. A61k 27/00

U.S. Cl. 424—327 24 Claims

Certain new (α-fluoroalkyl)benzoyl chloride phenylhydrazones have been found to be effective, broad-spectrum anthelmintics for suppressing parasitic worms in animals particularly sheep. The method of using the new compounds and new anthelmintic formulations are described. The new compound α,α,α-trifluoro-m-toluoyl chloride phenylhydrazone is effective at rates at least as low as 100 mg. per kilogram of body weight in sheep. The compounds are readily prepared by conventional chemical reactions.

ELECTRICAL

3,721,743
AN ELECTRIC SMELTING FURNACE OF THE CLOSED TYPE

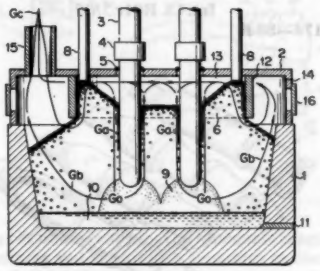
Toshio Shiina, Kokubungi-shi, Tokyo, and Itatu Tisaki, Setagaya-ku, Tokyo, both of Japan, assignors to Tanabe Kakoki Co., Ltd., Niigata-ken, Japan

Filed Sept. 15, 1971, Ser. No. 180,764

Claims priority, application Japan, Sept. 25, 1970, 45/83700; Sept. 28, 1970, 45/84542

Int. Cl. H05b *7/00;* **F27d** *13/00*

U.S. Cl. 13—9 **2 Claims**



A closed electric smelting furnace is provided with a cylindrical partition wall of substantially the same height as the furnace lid secured to the underside of the lid in a position to surround the electrodes and material feeding chutes. The partition together with the lid defines an annular gas collecting chamber. The raw materials are charged into the furnace to a level where they extend into the annular gas collecting chamber. Dust rich furnace gases rise quickly around the electrodes and collect in the upper portion of the chamber after which they pass slowly outwardly through the raw material so that they are filtered before leaving the furnace though a vent in the furnace lid which is positioned radially outwardly of the partition.

3,721,744
ELECTRICALLY HEATED PIT FURNACE, PARTICULARLY FOR MELTING VITREOUS SILICA

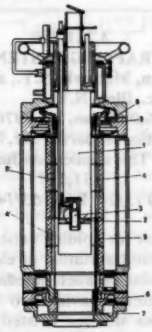
Karl Vatterodt, and Werner Weiss, both of Berlin, Germany, assignors to Patent-Treuhand-Gesellschaft fur Elektrische Gluhlampen mbH, Munich, Germany

Filed Dec. 1, 1971, Ser. No. 203,574

Claims priority, application Germany, Dec. 30, 1970, P 20 64 433.1

Int. Cl. H05b *3/40*

U.S. Cl. 13—25 **11 Claims**



To provide separately controllable temperature zones in the furnace, for melting of the silica, and for subsequent drawing into tubing or cane, heater wires, arranged in a ring around the crucible are formed to have two different cross sections, one being thick to form connecting portions and the other thin, to form heating portions, the thin cross sections of the heater wires being arranged adjacent the zones to be heated, the thick connecting portions passing through the other zones; the heater wires for the various zones are commonly connected at one axial end to a common connection ring, and at the other axial end to separate connection rings, for separate energization in accordance with heating requirements.

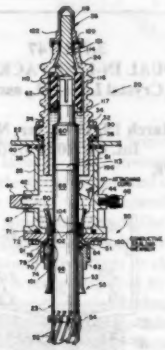
3,721,745
POTHEAD CONSTRUCTION AND METHOD OF TERMINATING A POWER CABLE THEREWITH

Argus F. Parks, and Byron G. Darnell, both of Greenville, Tex., assignors to ESCO Manufacturing Company, Greenville, Tex.

Filed June 16, 1971, Ser. No. 153,705

Int. Cl. H02g *15/22*

U.S. Cl. 174—19 **40 Claims**



A pothead device for termination of a power cable which is factory assembled, filled with dielectric insulating material and sealed to prevent contamination of and leakage of the dielectric material. A metallic cone-shaped stress relief device mounted in the terminator and electrically connected to the cable by means of a seal at the cable entrance portion of the pothead. This seal has a triangular shaped cross section of conducting rubber material which is mounted in the pothead so that it can be deformed or contracted by a gland nut. The seal is provided with an inwardly extending lip portion which has an enlarged cross section adjacent the inner periphery thereof. A removable plug which is displaced by the insertion of the cable is provided to seal the opening formed by this lip portion to prevent leakage of dielectric material from the pothead before the cable is inserted.

3,721,746
SHIELDING TECHNIQUES FOR R.F. CIRCUITRY

Thomas A. Knappenberger, Phoenix, Ariz., assignor to Motorola Inc., Franklin Park, Ill.

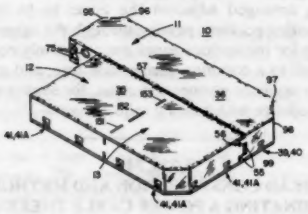
Filed Oct. 1, 1971, Ser. No. 185,552

Int. Cl. H05k *9/00*

U.S. Cl. 174—35 MS **12 Claims**

A technique for shielding R.F. circuitry is disclosed wherein thin metal strips are formed by chemical etching, and include bend or fold grooves similarly etched, the strips being bent into the desired configuration at the time of assembly. Printed circuit boards with the components all on one side and the connections all on the other are placed in the compartments

formed by the bent metal strips. Tabs are provided between the edges of the strips to hold the boards in place. Syntatic foam may be placed in the compartments on the component side and visco-elastic damping foam and or double sided pressure sensitive foam tape is placed between the bottom of the



printed circuit board and the bottom shield cover.

Covers also formed by chemical etching are attached to the top and bottom of the compartments and puncture resistant tape may be mounted on the inside of the top and bottom covers.

3,721,747

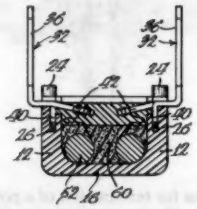
DUAL IN-LINE PACKAGE

John O. Renskers, Crystal Lake, Ill., assignor to Coilcraft Inc., Cary, Ill.

Filed March 15, 1972, Ser. No. 234,923

Int. Cl. H05k *3/30*

U.S. Cl. 174—52 PE **11 Claims**



A dual in-line package construction conforming exteriorly to a standard size but providing greater interior capacity and greater ease of circuit element mounting characterized by the mounting of bifurcated lugs by one leg only in the side walls of an open-topped box with the remaining legs extending from the free edges of the walls.

3,721,748

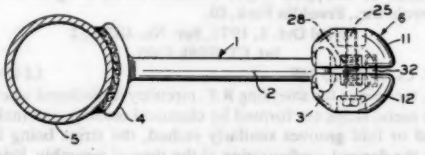
DEVICE FOR UPGRADING THE CORONA RESISTANCE OF GROUNDING STUDS

James J. Seaquist, Birmingham, Ala., assignor to Anderson Electric Corporation, Leeds, Ala.

Filed May 5, 1972, Ser. No. 250,509

Int. Cl. H01t *19/02*

U.S. Cl. 174—73 R **11 Claims**



The device is for upgrading the corona resistance of grounding studs used in the distribution of electrical power to and from substations so that, as voltages are upgraded to what are commonly referred to as "extra high voltages," the existing grounding studs can be modified to function efficiently at the higher voltages. The device is attached to the free end of the stud and in combination therewith provides an enlarged globular head. It can be installed on the stud in situ by means of tools mounted on "hot sticks."

3,721,749

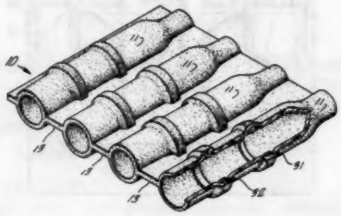
HEAT RECOVERABLE ARTICLES

Robin James Thomas Clabburn, Highworth, England, assignor to Rachem Corporation, Menlo Park, Calif.

Filed Nov. 16, 1970, Ser. No. 89,742

Int. Cl. H01r *5/00*

U.S. Cl. 174—88 R **14 Claims**



Described herein are means for simultaneously connecting multi-conductor flat cable to other such cable or to terminals of connector blocks or the like while providing for electrical insulation and environmental isolation of the resulting connections. The connection means comprise an open-ended hollow heat recoverable member having a train of longitudinal seams disposed across the width thereof integrally bonding the opposed walls thereof to one another to define and integrally connect a plurality of spaced parallel tubular members sized to receive individual conductors of the cable whereupon, in operation, the tubular members are heat recovered therearound. A soldered joint is formed between individual conductors of the cable and conductors or terminals of the device to which the cable is to be connected within said tubular members which serve to electrically insulate one connection from adjacent connections. Solder inserts may be positioned within the tubular members so that upon heat recovery of the connection device the solder fuses to form a permanent connection while simultaneously the connection device heat shrinks to isolate and insulate the formed connections. Fusible rings of polymeric material may be positioned within the tubular members to form solder dams. The heat recoverable connection device is preferably transparent to permit inspection of the formed connections.

3,721,750

STRAPPING FASTENER

Albert J. Countryman, Mohawk, N.Y., assignor to Ty-Lok Assembly Systems Inc., Ilion, N.Y.

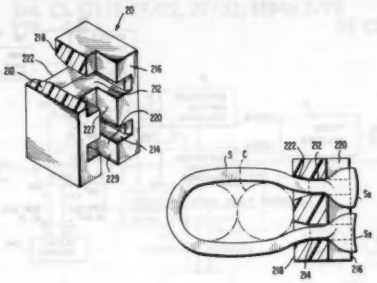
Division of Ser. No. 6,084, Jan. 27, 1970, Pat. No. 3,633,633, which is a continuation-in-part of Ser. No. 831,527, June 9, 1969, abandoned. This application June 9, 1971, Ser. No. 151,517

Int. Cl. B65b *13/24;* **B65d** *63/14;* **A44b** *11/04*

U.S. Cl. 174—135 **2 Claims**

A strapping fastener for holding twisted ends of a length of plastic strapping around a bundle of electrical conductors is formed of a rectangular parallelopipedal block of electrically insulating plastic material having two through-holes for the strapping and a cross slot for twisted strapping ends. The plastic strapping is generally rectangular in section and the through-holes in the fastener are parallel and of slightly larger section dimension to accommodate the strapping fed therethrough without twisting. The cross slot is in one face of

the fastener block extending perpendicular to the through-holes so that the twisted ends of the plastic strapping will be held in their twisted position thereby preventing the strapping



from slipping out of the fastener. The fastener is adapted to be used in a fastening system using an apparatus as disclosed in U. S. Pat. No. 3,633,633.

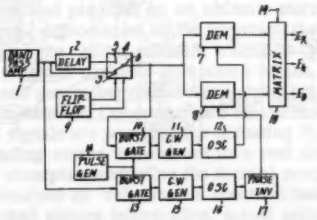
ERRATUM

For Class 174—50.64 see:
Patent No. 3,721,852

3,721,751
COLOR TELEVISION RECEIVER

Yoshiharu Taira, Shiyuku-ku, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed June 15, 1971, Ser. No. 153,251
Int. Cl. H04n 9/02
U.S. Cl. 178—5.4 P 14 Claims

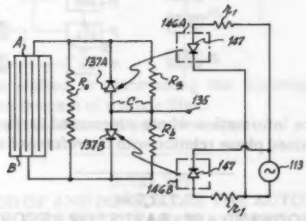


In a decoding system to receive PAL television signals, one reference sub-carrier signal is produced with the proper phase by controlling an oscillator with every burst signal and utilizing the time constant in the oscillator system to average the alternating phase of the burst signal. A second chrominance signal is demodulated by selecting alternate bursts and using them to control an oscillator to demodulate the chrominance signal along an axis other than the correct one. The resultant demodulated signals are properly combined in a matrix to separate the component color signals. Alternatively, burst-controlled signals with alternating phase can be vectorially added to burst control signals with the correct, fixed phase to produce reference sub-carrier signals of the correct phase and phase alternation for both chrominance components.

3,721,752
IMAGE PICKUP TUBE

Takehiro Kakizaki, Hodogaya-ku, Yokohama-shi, Kanagawa-ken, and Yasuharu Kubota, Fujisawa-shi, Kanagawa-ken, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 21, 1971, Ser. No. 210,425
Claims priority, application Japan, Dec. 24, 1970, 45/140392
Int. Cl. H04n 9/06
U.S. Cl. 178—5.4 ST 14 Claims



In an image pickup tube for a color television camera having a photoconductive layer for the conversion of images projected thereon into an electrical output and onto which a color separated image of an object to be reproduced is projected through a color filter which is part of the tube or separate therefrom and a pair of indexing electrodes disposed in close proximity to the photoconductive layer to electrically produce an index image on such layer in response to the application of different voltages to the indexing electrodes; two photovoltaic cells are included in the image pickup tube and electrically connected in parallel with each other between the indexing electrodes with their polarities reversed, and the photovoltaic cells are alternately activated by radiant energy originating outside the tube to provide the different voltages for producing the index image so that the electrical output is a composite signal containing a color video signal corresponding to the color separated image and a balanced index signal corresponding to the index image and by which individual color component signals may be separated from the color video signal. The electrical output is preferably derived at a junction between a pair of series-connected resistors also connected between the indexing electrodes; and a biasing voltage is also applied to the indexing electrodes by way of that junction.

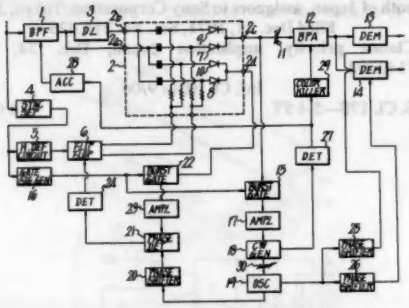
3,721,753
COLOR TELEVISION RECEIVER

Koichiro Mima, Kanagawa-ken, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Oct. 22, 1971, Ser. No. 191,764
Claims priority, application Japan, Oct. 26, 1970, 45/94188; April 13, 1971, 46/23299
Int. Cl. H04n 9/02
U.S. Cl. 178—5.4 P 12 Claims

A decoding system to receive PAL color television signals in which one line of chrominance information is applied to synchronous demodulators and the same line, delayed one line interval by means of a switching circuit and delay means, is again applied to the same demodulators. Detecting means are provided for detecting the phase of burst signals in the chrominance information applied to the demodulators. Reference subcarrier generating means connected to the demodulators are phase-controlled in response to the phase of the burst signals, and the switching circuit is controlled by the

output of the detecting means in response to the phase of the burst signal so as to apply to the demodulators only the



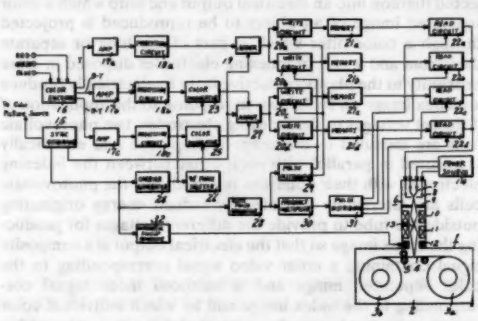
chrominance information whose suppressed carrier signal has a predetermined phase relation with the reference subcarriers.

3,721,754

METHODS AND APPARATUS FOR RECORDING SIGNALS

Sakae Miyauchi, Tokyo, Japan, assignor to Nihon Denshi Kabushiki Kaisha, Tokyo, Japan

Filed July 9, 1971, Ser. No. 161,186
Int. Cl. H04n *5/86*
U.S. Cl. 178—5.4 CD **6 Claims**



Methods and apparatus for recording a plurality of dissimilar signals such as the brightness, color and sound signals forming part of television signals, said signals being simultaneously generated by a generating means, said signals then being respectively memorized by individual memories and read out in accordance with a predetermined order, said read out signals being applied to the control electrode of an electron beam recorder in order to modulate the beam intensity, said signals then being finally recorded in monochrome on a radiant energy sensitive recording medium, and recorded at different positions on the recording medium in transverse formation.

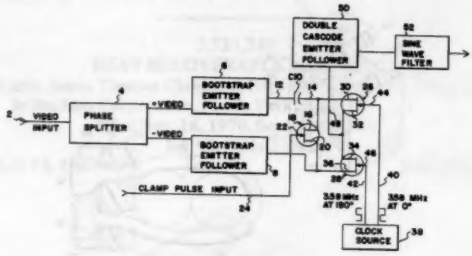
3,721,755

COLOR TELEVISION ENCODER MODULATOR

Philip V. C. Craig, Salt Lake City, Utah, assignor to Telemation, Inc., Salt Lake City, Utah

Filed March 29, 1971, Ser. No. 129,079
Int. Cl. H04n *5/40*; H03c *1/52*
U.S. Cl. 178—5.4 R **5 Claims**

A balanced modulator circuit for use in television cameras to impress color information on the chrominance subcarrier wherein the video input is phase-split and the resulting signals are fed through respective bootstrap emitter-followers, the outputs of these emitter-followers are chopped by respective field effect transistors gated by respective 3.58MHz clock signals which are 180° out of phase and a third field effect



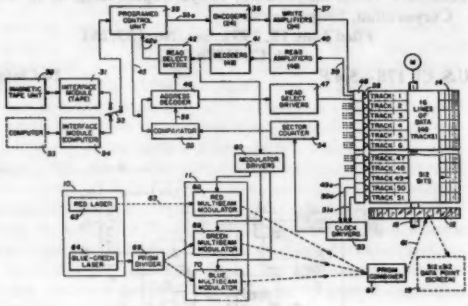
transistor, operated in a saturation mode wherein 10 ma. forward current is drawn, is connected across the outputs of the emitter-followers and gated by clamp source pulses to clamp the emitter-follower outputs at zero reference.

3,721,756

INFORMATION DISPLAY METHOD AND SYSTEM

Charles E. Baker, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of application Ser. No. 587,095, Oct. 17, 1966. This application Apr. 20, 1970, Ser. No. 29,941
Int. Cl. H04a *1/04*
U.S. Cl. 178—6 **13 Claims**

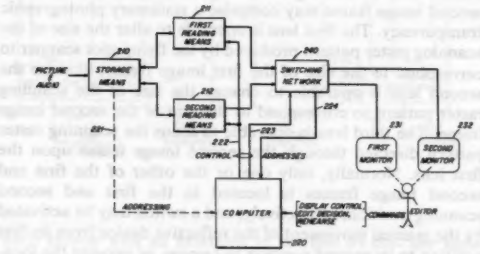


A large screen real time laser display system is described. A magnetic drum and a multi-faceted scanning mirror are mounted on a common shaft and rotated at a high rate of speed. Digital data descriptive of the image to be displayed is stored on a plurality of tracks on the drum and updated as required by a digital computer. The data is continually read from the drum and red, blue and green laser beams are split into a plurality of beams each of which is modulated in accordance with the stored information. The modulated beams are then recombined and directed onto the multi-faceted mirror which scans the beams over a screen to produce a full color image. The light modulators are acoustic modulator bodies in which stress waves having a plurality of separate wavelengths, each individually amplitude modulated, are established. This produces a plurality of individually amplitude modulated light beams.

3,721,757
METHOD AND APPARATUS FOR AUTOMATICALLY EDITING TELEVISION INFORMATION

Adrian B. Ettlinger, Hastings-on-Hudson, N.Y., assignor to Columbia Broadcasting System, Inc.

Filed Feb. 8, 1971, Ser. No. 113,429
Int. Cl. G11b 27/02, 27/32; H04n 5/78
U.S. Cl. 178—6.6 A **31 Claims**



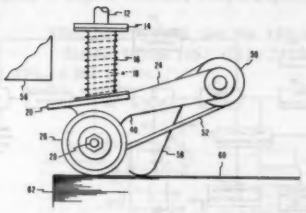
An automatic editor-controllable system for selecting excerpts from a source of electronic picture information and forming a program representative of the sequence of the excerpts. Means are provided for storing the picture information signals in a predetermined order, each frame of the picture information having an address associated therewith. First and second reading means are provided for simultaneously reading out picture information signals from two editor-selected regions of the stored picture information. First and second display means coupled to the reading means are adapted to simultaneously display to the editor the outputs of the reading means. Switching means couple the first and second reading means to the first and second display means. Means are provided for sensing and storing the addresses with the two regions corresponding to an editor-selected transition point as between the two regions. The stored addresses corresponding to editor-selected transition points constitute a "program" of excerpts which can later be utilized to form a final assembled program on an ultimate storage media. In a preferred embodiment of the invention the addresses corresponding to editor-selected transition points are stored in program operable computing means, the computing means generating digital signals which are a function of the addresses. Control circuits means responsive to the digital signals are provided for actuating the first and second reading means to read out in a real time the sequence of excerpts constituting the formed program. This real time readout or "rehearse" is accomplished by viewing the stored picture information, actual splicing or rerecording not being required.

3,721,758
CAMERA SCANNING DEVICE AND ANALYZING APPARATUS COMPRISING SUCH A DEVICE

Michel Joseph Auphan, Courbevoie, and Jean Robert Perilhou, Bourg-la-Reine, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed April 16, 1971, Ser. No. 134,802
Claims priority, application France, April 17, 1970, 7014012
Int. Cl. H04n 3/10, 5/26
U.S. Cl. 178—7.2 **11 Claims**

A plurality of analyzing fibers are arranged in the hollow shaft of one of the motors of a scanning device substantially in crown-like fashion around the optical center in the case of a single fiber, while the electron beam of the cathode-ray tube is caused to perform a wobbling movement so that the center of



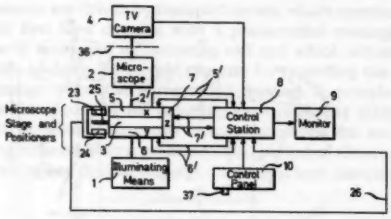
the beam is shifted in place along the scanning line corresponding to the case of a single fiber.

The device is used in medical endoscopy.

3,721,759
METHOD OF AND DEVICE FOR THE AUTOMATIC FOCUSING OF MICROSCOPES

Walter Lang, Aalen, Germany, assignor to Carl Zeiss-Stiftung, Wuerttemberg, Germany

Filed Feb. 11, 1971, Ser. No. 114,596
Claims priority, application Germany, Feb. 24, 1970, P 20 08 390.3
Int. Cl. H04n 7/18
U.S. Cl. 178—7.2 **10 Claims**



The invention contemplates a method and means whereby critical focus can be automatically achieved in a microscope, using TV scanning of the imaged object while the focused condition of the microscope is varied. As its criterion for critical focus, the invention in a preferred form uses a minimum-length or a minimum-area evaluation, while the fine-focus mechanism of the microscope is being driven, continuously and at constant speed. As soon as the television system indicates that the minimum of the measuring signal has been reached, the fine-focus drive is terminated. The microscope is then critically focused.

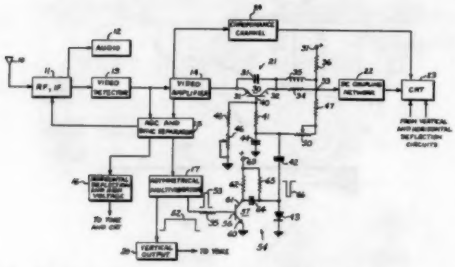
3,721,760
BLANKING CIRCUITRY FOR BLANKING A CATHODE RAY TUBE

Arthur Harold Klein, Oakfield, N.Y., assignor to GTE Sylvania Incorporated, Seneca Falls, N.Y.

Filed Aug. 26, 1971, Ser. No. 175,158
Int. Cl. H04n 5/44, 5/68
U.S. Cl. 178—7.5 R **9 Claims**

A blanking circuit for blanking a cathode ray tube by cutting off the video output transistor and hence the cathode ray tube in response to a retrace pulse from an asymmetrical

multivibrator is disclosed. The common electrode of the video output transistor is connected to a potential reference by a



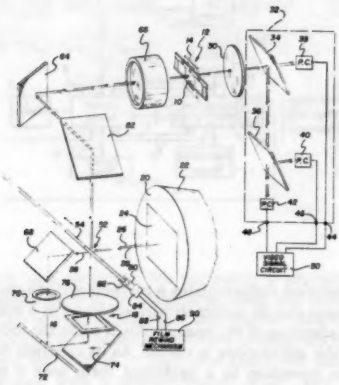
normally forward biased diode which is reverse biased by the blanking circuit during retrace intervals.

3,721,761

OPTICAL-TO-ELECTRICAL SIGNAL TRANSDUCER APPARATUS

William P. Ewald, Webster, and Lenard M. Metzger, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 23, 1971, Ser. No. 211,541
Int. Cl. G03b *21/12, 21/28;* H04n *9/08*
U.S. Cl. 178—7.88 **13 Claims**



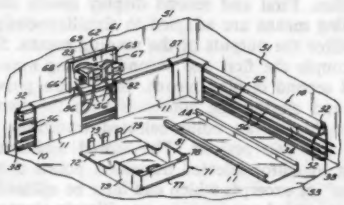
Method and apparatus for alternately scanning first and second image frames on information bearing media located in first and second scanning positions, respectively, and providing electrical signals representative of the information in the image frames. A scanning spot of light traversed in two dimensions in a repetitive raster pattern is produced by a flying spot scanner tube and is directed in a first path including the first scanning position of the first image frame or a second path including the second scanning position of the second image frame. A reflective device is operable between a first position for reflecting the scanning spot of light to a first lens which directs the scanning spot of light through the first scanning position in the first path and to optical-to-electrical signal transducer apparatus and a second position for directing the scanning spot of light through a second lens, the second scanning position, a third lens and to the first lens of the first path. Optical-to-electrical signal transducer apparatus responds to the intensity of the light transmitted by a first image frame located in the first scanning position when the reflective device is located in the first position or transmitted by a second image frame located in the second scanning position when the reflective device is located in the second position to produce electrical signals representative of the information content of the first or second image frame. The first image frame may be carried by a moving information bearing media such as moving motion picture filmstrips, and the second image frame may comprise a stationary photographic transparency. The first lens is operable to alter the size of the scanning raster pattern produced by the flying spot scanner to correspond to the size of the first image frame; likewise the second lens is operable to change the size of the scanning raster pattern to correspond to the size of the second image frame. The third lens is operable to focus the scanning raster pattern directed through the second image frame upon the first lens. Normally, only one or the other of the first and second image frames is located in the first and second scanning position, respectively, and a switch may be activated by the manual movement of the reflective device from its first position to its second position to remove or prevent the location of the first image frames in the first scanning position.

3,721,762

ELECTRICAL RACEWAY AND DECORATIVE MOLDING

Gale A. Gooding, Middlefield, Ohio, assignor to Johnson Plastic Corporation, Auburn Township, Ohio

Filed Dec. 8, 1971, Ser. No. 205,870
Int. Cl. H02g *3/04*
U.S. Cl. 174—48 **10 Claims**



An electrical raceway and decorative molding combination is disclosed which includes a retainer clip which is adapted to be secured to a wall and a removable cover member. The retaining clip and cover member are formed with extrusions shaped to provide a plurality of separate wire receiving channels along the raceway so that different types of wiring can be contained. An outlet structure is provided with an outlet receptacle adjacent to the raceway and a removable cover fits over the outlet receptacle and adjacent portions of the raceway.

3,721,763

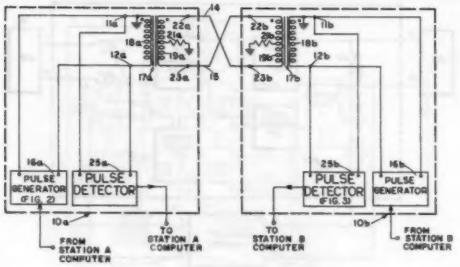
SINGLE LINE BI-DIRECTIONAL DATA TRANSMISSION SYSTEM

Alfred A. Homan, Collingswood, and Herbert P. Brockman, Riverton, both of N.J., assignors to The United States of America as represented by the Secretary of the Navy

Filed July 29, 1971, Ser. No. 167,409
Int. Cl. H04l *5/14*
U.S. Cl. 178—58 R **6 Claims**

Digital information is transmitted in either direction on a time sharing basis over a single transmission line having identical transmit/receive stations sending out pulse signals of one polarity and having detectors adapted to receive pulses of the opposite polarity. The detectors block pulses of the same

polarity as those that are generated and transmitted from its own station. A transmission line is transformer coupled to



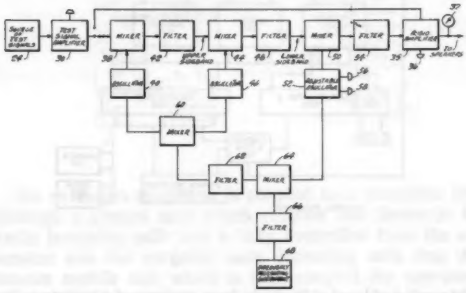
each station with an inversion in the line so that the signal received at the opposite station is of inverted polarity to that transmitted.

3,721,764

AUDITORY TEST FACILITY WITH MULTISTAGE SINGLE SIDEBAND HETERODYNING

Cletus M. Dunn, Waterford, Conn., assignor to The United States of America as represented by the Secretary of the Navy

Filed Jan. 14, 1970, Ser. No. 2,761
Int. Cl. A61b 5/12
U.S. Cl. 179—1 N **4 Claims**



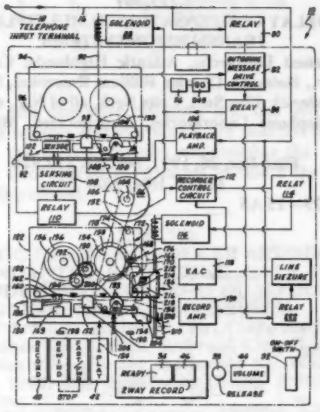
A facility for testing auditory characteristics of any person, but particularly a sonarman, and including a hi-fi speaker-equipped sound insulated chamber for the test candidate and a hi-fi speaker-equipped test post for an acoustician, a hi-fi audio amplifier for the speakers, an intercom linking the sound insulated chamber and the testing position, a source of tonal sound and of noise and including controls at the test post, a pitch changing circuit coupled to the audio amplifier and pitch deviation metering circuit including dependent pitch controls in the chamber and at the testing post coupled to pitch changing circuit plush a pitch deviation meter at the test post. A switch at the test pose enables the acoustician to coupled the source of tonal sound wither to the test chamber directly or indirectly via the pitch changing and pitch deviation metering circuit.

3,721,765

TELEPHONE ANSWERING MACHINE

Charles W. Ho, San Francisco, Calif., assignor to Dictran International Corporation, San Francisco, Calif. and Victor Company of Japan, Limited, Tokyo, Japan, part interest to each

Filed June 7, 1971, Ser. No. 150,428
Int. Cl. H04m 1/64; G11b 23/04
U.S. Cl. 179—6 R **4 Claims**



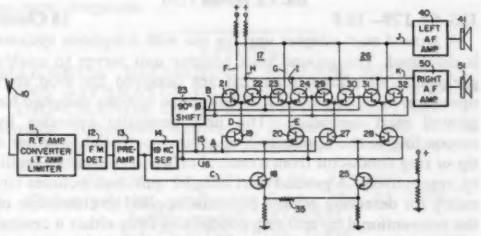
An automatic telephone answering machine for use in combination with a conventional telephone utilizes a first magnetic tape cassette to store a prerecorded message and a second tape cassette to record a caller's message. The two tape cassettes are driven by transport means which operates to drive the first tape cassette with a prerecorded message in response to receipt of an incoming call and which automatically shifts to drive the second cassette for recording the caller's message when the prerecorded message is completed. The machine provides for counting each incoming message received, an automatic cutoff circuit that stops the second recording cassette after a predetermined period of silence and for recording any desired message on the first tape cassette.

3,721,766

FREQUENCY MULTIPLYING CIRCUIT UTILIZING TIME GATES AND SWITCHING SIGNALS OF DIFFERING PHASES

Francis H. Hilbert, Addison, Ill., assignor to Motorola, Inc., Franklin Park, Ill.

Continuation-in-part of Ser. No. 849,853, Aug. 13, 1960, abandoned. This application Nov. 16, 1970, Ser. No. 89,706
Int. Cl. H04h 5/00
U.S. Cl. 179—15 BT **10 Claims**



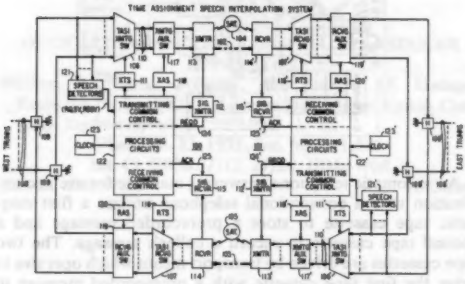
Demodulation of standard FM multiplex stereophonic signals is accomplished without using a 38kHz frequency doubler operating in response to the 19kHz pilot tone signal. The

first stage of demodulation is accomplished in a first gated symmetrical time gate which is supplied with the composite input signals and is switched in synchronism with the 19kHz pilot signal. The two outputs of this time gate then constitute inputs to second and third time gates which are synchronously switched by a 19kHz signal at quadrature with the signal switching the first time gate. By combining appropriate outputs of the second and third time gates, the demodulated left and right audio information is obtained.

3,721,767
DELAY COMPENSATION IN MULTIPLEX TRANSMISSION SYSTEMS

Robert Ernest LaMarche, Atlantic Highlands; Carl Jerome May, Jr., Holmdel; Charles William Rosenthal, Short Hills, and Frederick Alan Saal, Colts Neck, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 28, 1971, Ser. No. 212,920
Int. Cl. H04j *5/00*
U.S. Cl. 179—15 AS **12 Claims**



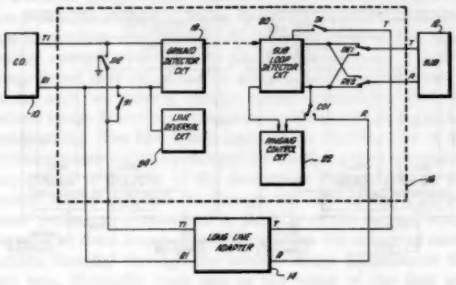
A time assignment speech interpolation system is disclosed utilizing time-shared common control processing circuits. Speech signals from a plurality of trunks are interpolated on a lesser plurality of transmission channels by connecting trunks only during active periods. In order to accommodate transmission channels of varying delay times (e.g., cable and satellite channels), receiving terminal switching operations are delayed for a time corresponding to the transmission delay of the corresponding channel. This is implemented by common control digital delay time-out for each new connection.

3,721,768
GROUND START ADAPTER UNIT

Frank P. Mazac, Santa Ana, and Alan R. Fitzsimons, Laguna Beach, both of Calif., assignors to San/Bar Corporation, Santa Ana, Calif.

Filed Oct. 4, 1971, Ser. No. 186,270
Int. Cl. H04m *1/50*
U.S. Cl. 179—16 F **18 Claims**

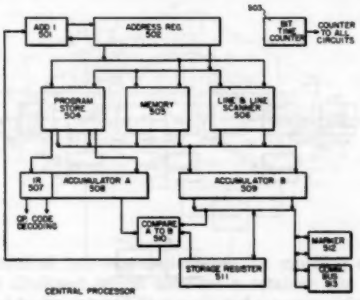
A ground start adapter unit for use with telephone systems is disclosed. The ground start adapter unit serves to enable peripheral telephone units that are designed for loop start operation to be employed with telephone systems designed for ground start operation. The unit generally operates by responding to the application of ground potential to either a tip or ring conductor from a central office or subscriber facility, respectively. A ground start adapter unit thus includes circuitry for detecting ground potential applied to either one of the conventional tip and ring conductors from either a central office or from a subscriber facility. Also included is circuitry for detecting a loop condition at the subscriber facility and circuitry for tripping the transmission of ringing signals from the central office when the subscriber facility is in an off-hook condition. A reversal circuit operates to detect any polarity reversal of the line conductors from the central office and effect a corresponding reversal of the line conductors connected to the subscriber facility.



3,721,769
CALL METERING FOR PABX TELEPHONE SYSTEM

Elmer W. Krock, Chicago, and Charles J. Simon, Hinsdale, both of Ill., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed July 22, 1971, Ser. No. 162,215
Int. Cl. H04m *15/34*
U.S. Cl. 179—18 AD **6 Claims**



Metering of local calls made from stations of a private automatic branch telephone system, is provided for use in hotels, motels, etc. The attendant can secure up-dated information as to calls from each station, on a common readout display.

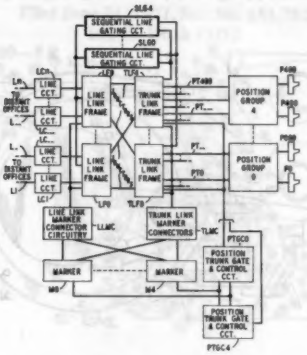
3,721,770
SEQUENTIAL GATING CIRCUIT

Robert Gary Beidel, Reynoldsburg; Thomas Victor Burns, and John Mason Catterall, both of Columbus, all of Ohio, assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 22, 1971, Ser. No. 155,427
Int. Cl. H04m *3/60*
U.S. Cl. 179—27 D **21 Claims**

A system is disclosed for automatically distributing calls from groups of incoming lines through crossbar switch line and trunk link frames to teams of operator positions under control of markers. Sequential line gating circuits continually monitor the trunk link frames for idle trunks to operator posi-

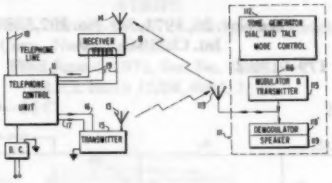
tions and compare the number of such frames having idle trunks with the number of line link frames enabled to bid for service by the markers for establishing call connections to operators. The gating circuits include scanners that sequentially examine and then gate each of the line link frame requests for markers only after the comparison indicates that more trunk link frames have idle position trunks than there are line link frames gated to bid for service by markers.



3,721,771
TELEPHONE RANGE EXPANDER

Gene Greneker III, 730 Wildwood Road NE., Atlanta, Ga. 30324

Filed Dec. 12, 1969, Ser. No. 884,505
Int. Cl. H04m *3/06*
U.S. Cl. 179—41 A 10 Claims



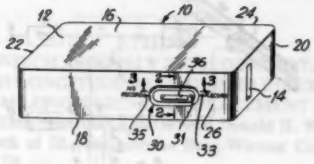
An extension telephone is coupled to a telephone line through a control unit which receives and forwards by radio incoming calls and is fully controlled from the extension unit for outgoing calls. Incoming calls ring the remote mobile unit which is then coupled for conversation to the line through a control unit actuated from the extension unit. The mobile unit transmits actuation and dialing signals to the control unit for outgoing calls from the mobile unit in response to successively transmitted tone modulations to dial any party on the telephone line and thereupon connects the mobile microphone and receiver directly to the line.

3,721,772
TAPE CASSETTE WITH A REMOVABLY MOUNTED ERASURE PREVENTION MEANS HAVING TWO OPERATIVE POSITIONS

Yotaro Miura and Yoshiharu Matsumoto, Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed July 20, 1970, Ser. No. 56,484
Claims priority, application Japan, July 22, 1969 (utility model), 44/69,661
Int. Cl. G11b *15/04*
U.S. Cl. 179—100.2 D 5 Claims

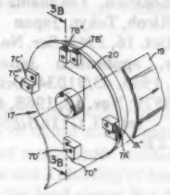
A tape cassette for use in a tape recording and reproducing apparatus having a switch adapted to be engaged by the cassette for controlling the recording circuit of the apparatus and placing the recording circuit in its operative and inoperative modes. The cassette has a safety device adapted to be removably mounted on the cassette in at least two operative positions and has first and second switch control surfaces which are selectively adapted to engage the switch, thereby maintaining the switch in one of its two operative positions to select the mode of the recording circuit.



3,721,773
MAGNETIC HEAD TRANSDUCER ASSEMBLY FOR REDUNDANTLY RECORDING DATA ON AND REPRODUCING DATA FROM DUAL-TRACKS OF A MAGNETIC RECORDING MEDIUM

Gerald A. Kluge, Redwood City, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Continuation of abandoned application Ser. No. 695,542, Dec. 7, 1967. This application Oct. 9, 1970, Ser. No. 79,647
Int. Cl. G11b *5/28, 5/44, 5/52*
U.S. Cl. 179—100.2 T 9 Claims



A data processing method and system for redundant recording and reproducing of digital or other forms of data on a magnetic medium utilizing a single channel of processing electronics. In record, the data is fed through a single channel of processing electronics to a pair of transducers of a head assembly whereat the signal is divided to create two redundant tracks on the tape. In playback, the redundant data is simultaneously reproduced from dual tape tracks and summed together directly at the head assembly and processed as a single playback signal by a standard single channel of processing electronics to reconstitute the original data with negligible error due to tape dropouts.

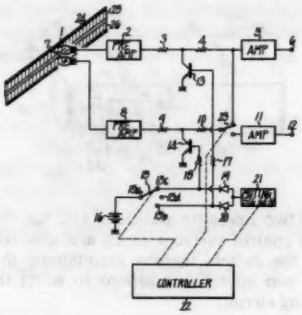
3,721,774
MAGNETIC RECORDING AND/OR REPRODUCING APPARATUS WITH SIGNAL MUTING DURING CHANGE OF OPERATIVE CONDITION

Hiroshi Yonemoto, Urawa-shi, Saitama-ken, and Koichi Kawakyu, Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed May 14, 1971, Ser. No. 143,483
Claims priority, application Japan, May 21, 1970 (utility model), 45/49,631
Int. Cl. G11b *15/18, 21/08*
U.S. Cl. 179—100.2 MD 15 Claims

In a magnetic recording and/or reproducing apparatus capable of reproducing signals recorded on a magnetic tape during movement of the tape in both forward and

reverse directions, at least two magnetic heads pick up the signals from the tape and independent signal transmitting lines are provided for transmitting the signals from the corresponding magnetic heads to a common output terminal, such signal transmitting lines having switching means for muting the signals during changing of the operative condition of the apparatus and also for selecting the signal or signals to be reproducing during movement of the tape in the forward or reverse direction.



3,721,775

DEVICE FOR TRANSFERRING MAGNETIC SIGNALS FROM A MASTER SHEET TO MAGNETIC SHEETS

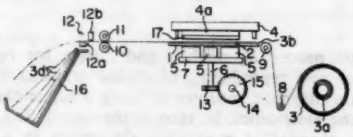
Sakae Fujimoto, Chofu-shi, Tokyo; Saburo Kato, Koto-ku, Tokyo; Masimi Koizumi, Kawasaki-shi, Kanagawa-ken, and Takaji Sue, Kohoku-ku, Yokohama-shi, all of Japan, assignors to K. K. Ricoh, Tokyo, Japan

Filed Oct. 16, 1969, Ser. No. 867,007

Claims priority, application Japan, Oct. 20, 1968, 43/76057; Oct. 20, 1968, 43/91034; Oct. 20, 1968, 43/91035; Oct. 23, 1968, 43/3579; Nov. 18, 1968, 43/84374

Int. Cl. G11b *5/86*

U.S. Cl. 179—100.2 E **4 Claims**



Device for transferring magnetic signals of a master sheet having a spiral recording track to magnetic sheets wherein a magnetic sheet to be copied (transferred) is intermittently fed so as to be overlaid upon the master sheet held stationary; both of the master and magnetic sheets are pressed against each other by a vertically movable pressure plate; the magnetic fields are applied to both of the sheets for transfer; and the holes for positioning are punched through the magnetic sheet by the punching means fixed to the pressure plate.

3,721,776

MAGNETIC RECORDING AND/OR REPRODUCING APPARATUS

Katsu Inaga, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

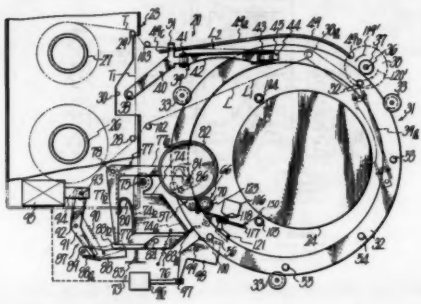
Filed Aug. 11, 1971, Ser. No. 170,785

Claims priority, application Japan, Aug. 11, 1970, 45/79882

Int. Cl. G11b *5/52*

U.S. Cl. 179—100.2 T **14 Claims**

A magnetic recording and/or reproducing apparatus of the type having a tape guide drum, at least one rotary magnetic head to scan a tape wrapped on the drum, a stationary magnetic head positioned on a tape path to erase a previously recorded signal from the tape, or to record an information signal on the tape or reproduce previously recorded information, and an automatic tape guide device for automatically threading and wrapping the tape on the guide drum. Such apparatus further includes a movable magnetic shielding means to protect a recorded signal on the tape from undesired magnetic flux produced by the stationary magnetic head. Said movable magnetic shielding means is positioned in front of said stationary magnetic head by the tape guide device carried at a predetermined position to wrap the tape on the guide drum.



3,721,777

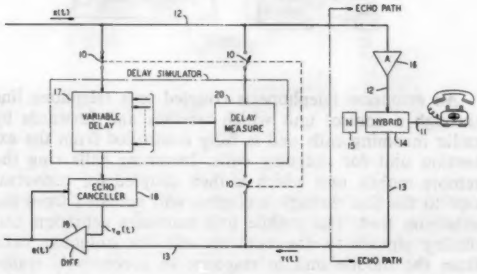
ECHO PATH DELAY SIMULATOR FOR USE WITH ADAPTIVE ECHO CANCELLERS

Edmond Joseph Thomas, New Shrewsbury, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 26, 1971, Ser. No. 202,338

Int. Cl. H04b *3/20*

U.S. Cl. 179—170.2 **8 Claims**

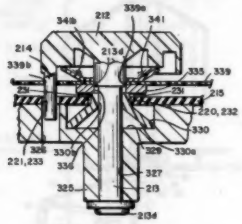


The echo path of a four-to-two wire junction is bridged by a variable delay device and an adaptive echo canceller connected in series. If the variable delay device is controlled so as to provide a delay to an incoming signal equal to the echo path delay, the number of taps required in the echo canceller can be reduced and the stability of the canceller thereby improved. To this end, a delay measuring circuit serves to form the cross-correlation function between the incoming or echo generating signal and the echo. The point at which this cross-correlation function is first determined to be a maximum corresponds to the echo path delay. The determination is then used to control the variable delay device so as to achieve a delay therein substantially equal to the echo path delay.

3,721,778
KEYBOARD SWITCH ASSEMBLY WITH IMPROVED OPERATOR AND CONTACT STRUCTURE

Richard E. Seeger, Jr., Marblehead, and William J. Lynn, Groveland, both of Mass., assignors to Chomerics, Inc., Woburn, Mass.

Filed June 21, 1971, Ser. No. 154,752
Int. Cl. H01h *13/52*
U.S. Cl. 200—5 R **8 Claims**

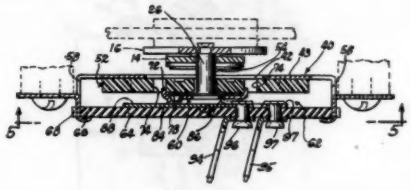


An encoded keyboard device which includes a plurality of layers of insulator material, at least two of which have patterns of electrically conductive material supported thereby, a plurality of holes extending through one of said layers and positioned with respect to said conductive patterns so that electrically conductive material may extend through the holes and electrically interconnect the patterns, and a plurality of keys adapted to push electrically conductive material against one of said patterns to produce a coded output representative of the key depressed.

3,721,779
SLIDING ACTION ELECTRICAL SWITCH WITH RAMP PORTIONS BETWEEN CONTACTS AND INSULATING STRIPS

Andrew F. Raab, Morton Grove, Ill., assignor to Indak Manufacturing Corp., Northbrook, Ill.

Filed June 4, 1971, Ser. No. 150,037
Int. Cl. H01h *15/04, 9/06, 3/50*
U.S. Cl. 200—16 C **2 Claims**

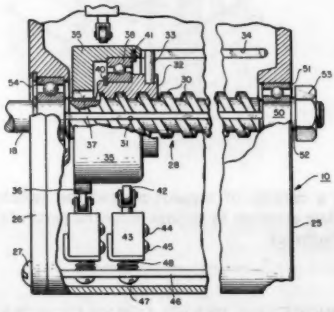


The illustrated switch comprises an insulating carriage which is slidable longitudinally within a casing. The carriage is arranged to be actuated by a pin which projects into an opening in the carriage through a slot in the casing. In this case, the pin is movable along a curved path and is slidable in the opening, which is laterally elongated. A contactor is mounted on the carriage and is provided with three contact points which are engageable with three contact strips secured to an insulating support on the casing. A spring is provided to bias the contactor toward the contact strips. The strips extend parallel to the path of movement of the contactor and are disposed along laterally spaced lines. The line of the first strip extends between the lines of the second and third strips. Two terminals are connected to the first strip and the second and third strips, which are connected together. The switch has an off position in which the first contact point engages the first strip, while the second and third contact points engage insulating bosses or projections disposed opposite the ends of the second and third strips. Upon movement of the contactor, the second and third contact points move smoothly from the insulating bosses into substantially simultaneous engagement with the ends of the second and third strips, which are provided with inclined ramp portions. Throughout a range of movement of the carriage, the three contact points engage the three contact strips.

3,721,780
LIMIT SWITCH ASSEMBLY INCLUDING ROTATABLE CAM WITH LONGITUDINALLY GUIDED INDEXING NUT AND CAM LONGITUDINAL DISPLACEMENT MEANS

Robert R. Kelly, Hoffman Estates, and Donald H. Ward, Glen Ellyn, both of Ill., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed May 4, 1971, Ser. No. 140,192
Int. Cl. H01h *3/16*
U.S. Cl. 200—47 **5 Claims**



A switch assembly provides position signals from a series of switches as a function of motor shaft rotation. A lead screw, rotated as a function of motor shaft rotation, includes an exterior threaded surface and a plurality of longitudinal slots. An indexing nut rides on the lead screw, but the indexing nut is restrained against rotation. A rotatable cam body has a plurality of drive tangs which extend into the lead screw slots, to afford rotation of the cam body in accordance with lead screw rotation. A bearing with a pair of snap rings translates the longitudinal movement of the indexing nut into a corresponding longitudinal displacement of the cam body. The cam has a lobe positioned to contact and selectively actuate the extending portions of a series of switches as the cam body is rotated and displaced lengthwise.

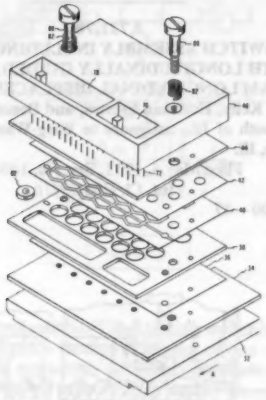
3,721,781
PNEUMATIC READ HEAD FOR DOCUMENT CARDS

John W. Berkman, Oronoco; Richard E. Lagergren, Rochester; Merlin J. Ricklefs, Rochester, and Walter S. Schaffer, Rochester, all of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 7, 1971, Ser. No. 187,491
Int. Cl. H01h *43/08*
U.S. Cl. 200—46 **13 Claims**

A pneumatic read head or switch assembly having a row of air reception ports therein into which jetted air may flow after passing through the apertures of a document card, the reception ports being connected with air pressure responsive switches by means of equal length air passages. The switches comprise pistons movable under the influence of air pressure, and the pistons are disposed in a plurality of rows each of which extends parallel with the row of reception ports and spaced sideways therefrom. Each of the pistons is effective on the center of a bar portion of copper cladding for moving the

center of the bar portion into contact with another contact, and the bar portion and other contact for each switch is surrounded by bar portions arranged in hexagonal form for



providing a column of support around the switch. A rigid backing plate acted on by springs holds the parts of the switch assembly together.

3,721,782

TRIGGERING DEVICE FOR SWITCHGEAR

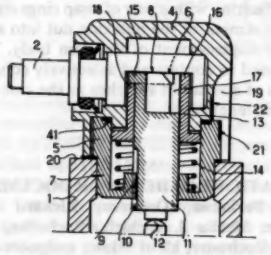
Michel Roumagnac, Angouleme, France, assignor to La Telemecanique Electrique, Nanterre, France

Filed April 17, 1972, Ser. No. 244,385

Claims priority, application France, April 21, 1971, 7114119

Int. Cl. H01h *3/16*

U.S. Cl. 200—47 **7 Claims**



Triggering device for switchgear, characterized by an oscillating shaft 2 acting as a control unit and cooperating with an adjustable transmission unit consisting of two component parts 11, 7 and connected to the contact 12, this unit being accessible from outside without dismantling to enable it to assume several easily recognizable positions, at the same time keeping the dimensions the same as those of non-adjustable devices.

Applied to the control of the travel of moving parts in machinery.

3,721,783

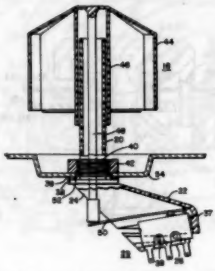
OVERFLOW FLOAT ARRANGEMENT FOR DISHWASHER

Charles L. Hancock, Columbus, Ohio, assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed July 27, 1971, Ser. No. 166,385

Int. Cl. H01h *35/18*

U.S. Cl. 200—84 R **3 Claims**



An overflow control float arrangement in which a structurally integral member secured to the bottom wall of the dishwasher tub includes a float guide portion projecting up into the tub and a switch mounting portion located below the tub wall so that as assembled the adjusted relation between the float and control switch is automatically obtained.

3,721,784

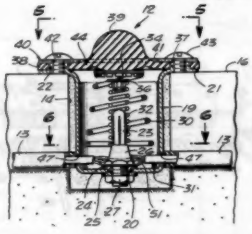
IMPACT RELIEF PRESSURE SWITCH FOR ROADWAY VEHICLE DETECTOR

Joseph R. Viracola, 1423 7th Street, Santa Monica, Calif.

Filed April 14, 1972, Ser. No. 244,115

Int. Cl. H01h *13/16*

U.S. Cl. 200—86 R **15 Clain**

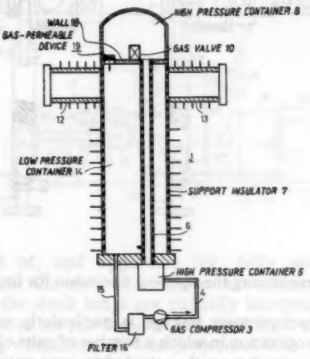


A pressure switch is disclosed for use in a roadway vehicle detector system. The pressure switch includes a cylindrical metal case which has a diaphragm of resilient material secured on the open top thereof. The diaphragm is formed with a protruding solid bulb on the upper surface thereof. A spring assembly comprised of an outer spring with a shorter and smaller diameter inner spring nested therein is enclosed within the case with the diaphragm bulb located above the outer spring. A cable having a plurality of conductors has one of its conductors connected to the lower end of the outer spring and another of its conductors connected to an isolated conductive member centrally located on the bottom of the case. When a tire of a vehicle passes over the switch it depresses the solid bulb of the diaphragm into the case to thereby depress the outer spring and enable a contact on the end of the inner spring to close the electrical circuit between the conductors of the cable.

3,721,785
PRESSURE SWITCH DEVICE HAVING A PRESSURE DEPENDENT CIRCUIT FOR A COMPRESSOR

Karl Heinz Picard, and Horst Eggert, both of Berlin, Germany, assignors to Siemens Aktiengesellschaft, Berlin, Germany

Filed June 11, 1971, Ser. No. 152,096
Int. Cl. H01h *33/57*
U.S. Cl. 200—148 B **8 Claims**

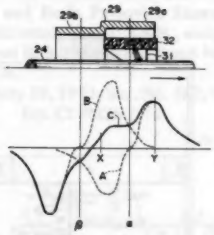


A pressure gas switch has a gas-permeable device which is a plate of porous material having an area with dimensions larger by at least one order of magnitude than the thickness of the plate.

3,721,786
CIRCUIT BREAKER

Yoshio Yoshioka, Hitachi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 30, 1971, Ser. No. 203,234
Int. Cl. H01h *33/88*
U.S. Cl. 200—148 A **7 Claims**

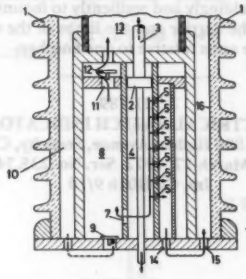


A puffer type circuit breaker is provided in which an arc extinguishing gas is compressed and released into an arc between contacts upon the initiation of an interrupting operation. The means for compressing the arc extinguishing gas is actuated by an electromagnetic driving means comprising at least two electromagnetic driving units provided by a primary coil and a short ring electromagnetically coupled to said primary coil, and the electromagnetic driving means exhibits a stepped electromagnetic driving force characteristic in response to the displacement in the driving direction when a predetermined current flows in the primary coil. Thus, current arcs for a range of small and medium currents may be extinguished by means of gases compressed by the driving forces generated in the neighborhood of the upper step portion of the stepped electromagnetic driving force characteristic and directed to the current arcs, while current arcs for a range of large currents may be extinguished by means of gases compressed by the driving forces generated in the neighborhood of the lower step portion of the stepped electromagnetic driving force characteristic and directed to the current arcs.

3,721,787
MINIMUM FLUID CIRCUIT BREAKER INCLUDING STROKE-DEPENDENT INJECTION OF QUENCHING FLUID INTO SWITCH CONTACT CHAMBER

Robert Wehrli, Nurensdorf, Switzerland, assignor to Aktiengesellschaft Brown, Boveri & Cie, Baden, Switzerland

Filed May 10, 1971, Ser. No. 141,799
Int. Cl. H01h *33/68*
U.S. Cl. 200—150 A **1 Claim**



A minimum-fluid circuit-breaker includes a quenching chamber in which the fixed and movable contacts are located, a pump of the piston-cylinder type, the piston being rigidly connected to the movable contact and serving to force arc-quenching fluid from the pump cylinder into a pressure chamber and thence from the latter through non-return valving into the quenching chamber to facilitate arc extinction as the contacts disengage. The rate-of-flow of the arc quenching fluid into the quenching chamber is varied during movement of the pump piston. By utilizing a row of bypass ports in the pump cylinder which are progressively cut out by the piston during its movement in the contact opening direction, the flow rate is progressively increased. By utilizing a double concentric pump piston arrangement both pistons act conjointly on the fluid during the initial part of the piston movement to provide a high flow rate while thereafter only the smaller of the two pistons is effective thus providing a correspondingly lower flow rate. When the contacts reclose, the pressure chamber and pump cylinder refill with fresh fluid from a reservoir.

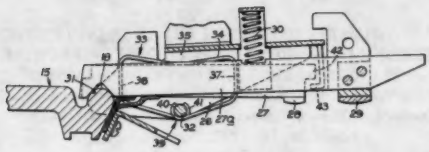
3,721,788
LOCATOR SPRING STRUCTURE FOR CONTACT ASSEMBLY OF HIGH VOLTAGE ELECTRICAL CIRCUIT BREAKERS

Alan Lister Kidd, Southport, England, assignor to Dorman Smith Switchgear Limited, Preston, England

Filed Sept. 29, 1971, Ser. No. 184,800
Claims priority, application Great Britain, Oct. 22, 1970, 50,094/70
Int. Cl. H01h *1/50, 9/30*
U.S. Cl. 200—166 R **6 Claims**

An electrical circuit breaker or isolator, intended to carry high currents of the order of 100,000 amperes, has for each pole a respective moving contact assembly comprising a plurality of parallel-connected movable contact arms each carrying a respective movable contact, said arms being of strip metal, to reduce manufacturing costs, are disposed side-by-side and substantially parallel in a carrier, each said arm being mounted in the carrier by a respective locator spring shaped to provide a loading portion which engages one longitudinal edge of the arm and a pair of limbs extending across the arm one adjacent each side thereof and which locates on a cross-

member, extending transversely of the arms, of the carrier adjacent the other longitudinal edge of the arm, the locator



springs serving yieldingly and resiliently to mount the movable contact arms in the carrier and the limbs of the springs effectively locating the arms relative to one another.

3,721,789

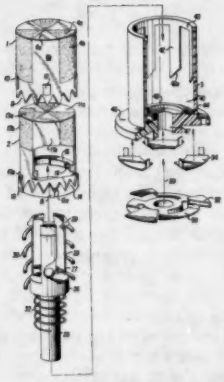
ELECTRICAL SWITCH INDICATOR

Marion R. Black, 804 Hallam Avenue, Security, Colo.

Filed March 17, 1972, Ser. No. 235,742

Int. Cl. H01h *9/16*

U.S. Cl. 200—167 R **10 Claims**



A push-button electrical switch indicator for simultaneously changing an electrical contact and readily indicating a new switch position. A drive member imparts a rotary motion to an indicia-bearing rotor which connects to a central shaft to change the electrical contacts. The rotor indicia are visible from the top and side of the switch assembly.

3,721,790

CONTACT-PRESSURE LINKAGE FOR A CIRCUIT INTERRUPTER OF THE TORSION-SPRING TYPE

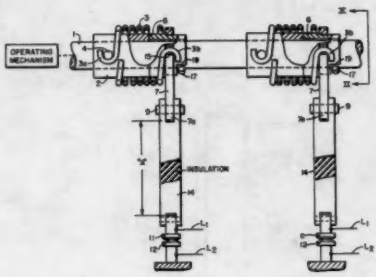
Charles D. Bice, Pittsburgh; Frank W. Senchur, Delmont, both of Pa., and Robert A. Few, Bloomington, Ind., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 10, 1971, Ser. No. 141,686

Int. Cl. H01h *1/50*

U.S. Cl. 200—170 A **7 Claims**

A rotatable operating shaft carries a contact-pressure torsion spring thereon, one end of the torsion spring being secured to the rotatable operating shaft itself, and the other end of the torsion spring biasing a contact arm, which loosely slides about the rotatable operating shaft. The free end of the contact arm is mechanically linked to the movable contact of a circuit interrupter to cause the opening and closing motions thereof. The rotatable contact arm is affixed to a sleeve which slidably rotates about the operating shaft, and has an abutment portion, which during the opening operation, makes impact engagement with an impact pin, the latter moving with the operating shaft, and striking the abutment portion of the



slidable sleeve during the opening operation for impact opening.

The contact-pressure linkage is particularly suitable for multi-phase operation in which a number of pairs of separable contacts are simultaneously actuated in gang-operation by a single common rotatable operating shaft actuated by a single mechanism.

3,721,791

ARCUATE FORM ELECTRICAL SWITCHES HAVING AN AXIALLY DISPLACEABLE ACTUATOR

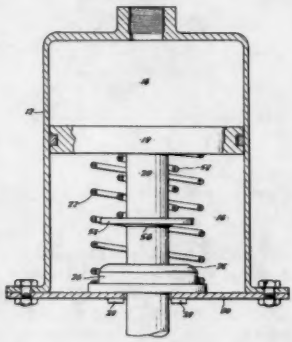
Gordon Grieves, Newcastle upon Tyne, and Brian Astbury Holden, Washington, both of England, assignors to Burgess Micro Switch Company Limited, Gateshead, Durham, England

Filed June 25, 1971, Ser. No. 156,817

Claims priority, application Great Britain, July 1, 1970, 31,996/70

Int. Cl. H01h *9/04*

U.S. Cl. 200—168 G **13 Claims**



An electrical switch device is adapted for use in conjunction with a fluid-operated cylinder and piston mechanism, for example to indicate overtravel of the mechanism. The device is in the form of a ring and surrounds the piston rod. It has a sealed housing for the contact elements of the switch, the top wall of the housing being resiliently deformable by a spring-mounted operated member carried by the piston rod to open the switch contacts.

3,721,792

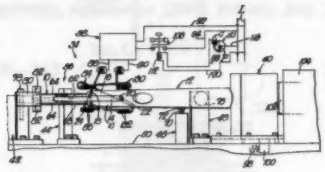
APPARATUS FOR BURN-FITTING WOODEN GUN STOCKS TO METAL RECEIVERS

Stephen J. Morris, North Haven, and James M. O'Keefe, Cheshire, Conn., assignors to The Marlin Firearms Co., North Haven, Conn.

Original application June 4, 1971, Ser. No. 149,904, now Patent No. 3,697,715. Divided and this application May 25, 1972, Ser. No. 257,004

Int. Cl. H05b *5/08*

U.S. Cl. 219—10.57 4 Claims



Method of, and apparatus for, fully seating on a receiver end the ends of tangs on a wooden gun stock, of which the stock tangs are partially interprojected with receiver tangs on the receiver end, and have excess wood interfering with their full interprojection with the receiver tangs, with the partially interprojected receiver and stock being placed in a holding fixture, and only part of the held receiver therein, including its end, being subjected to high-frequency induction heating to stock-burning temperature, whereupon the stock is driven into full interprojection with the held receiver to the extent of a complete burn-fit of the stock tang ends with the receiver end.

3,721,793

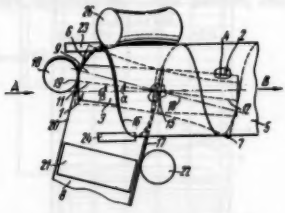
SPIRAL-SEAM WELD PIPE AND TUBE MILL

Jury Nikolaevich Skachko; Venedikt Feofanovich Moshkin; Rodimiz Ivanovich Gazkaljuk; Vladimirovich Popov; Valery Vasilievich Polukhin, all of Kiev; Igor Illarinovich Kazakevich, Moskovskaya oblast, Elektrostal; Alexandr Nikolaevich Medvedov, Mosovskaya oblast, Elektrostal; Vladimir Alexandrovich Korshunov, Moskovskaya oblast, Elektrostal; Vladimir Mikhailovich Bokov, Moskovskaya oblast, Noginsk, and Boris Pavlovich Skorudsky, Moskovskaya oblast, Elektrostal, all of U.S.S.R., assignors to Institut elektrosvarki imeni E.O. Patona Akademii Nauk Ukrainskoi SSR, Kiev, U.S.S.R.

Filed July 19, 1971, Ser. No. 163,755

Int. Cl. B23k *1/16*

U.S. Cl. 219—62 5 Claims



A mill is provided with a device for pipe or tube forming by strip wrapping into a spiral, a device for the pressure welding of convergent edges of a strip and pipe, being formed therefrom and a device for locating the strip to form it into the spiral and to weld the convergent edges of the strip and pipe, being formed therefrom. The pipe forming device comprises at least two pairs of rolls arranged opposite each other in the direction of the strip motion or movement so that the roll exteriors act as guides for abutting convergent edges of the strip during the welding process, with one roll in each pair being mounted outside and the other roll inside the pipe (tube) to be formed. The geometric axes of the external rolls are disposed at right angles to the direction of the strip movement and those of the internal rolls — at an angle to the direction of the pipe movement less than the angle defined by the axis of the external rolls and the direction of the pipe movement.

3,721,794

CLUTCH DEVICE

Shoji Jinbo, Okazaki; Setsuo Kedo, and Takehisa Yaegashi, both of Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota City, Aichi-ken, Japan

Filed Dec. 13, 1971, Ser. No. 207,496

Claims priority, application Japan, Dec. 22, 1970, 45/130284

Int. Cl. F16d *13/44*

U.S. Cl. 192—70.19 2 Claims

A clutch device comprising a flywheel, a pressure plate and a clutch disk interposed between said flywheel and said pressure plate for clutching and declutching the fly-wheel and clutch disk to effect or interrupt power transmission therethrough by bringing the pressure plate into or out of pressing engagement with the clutch disk. Said clutch disk is brought into engagement with a driven shaft through a spline connection of an angle of torsion capable of producing an axially directed thrust acting in a direction in which the clutch disk moves away from the flywheel when the driven shaft is driven by the clutch disk.

3,721,795

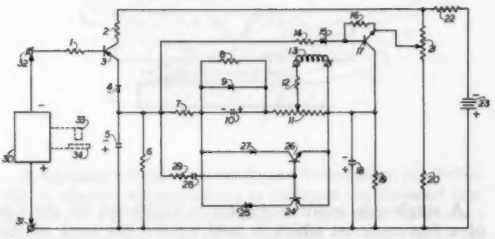
SERVOMECHANISM FEED SYSTEM

Walter Lobur, Clawson, Mich., assignor to Electronic Removal of Metals, Inc., Clawson, Mich.

Filed Jan. 11, 1972, Ser. No. 217,008

Int. Cl. B23p *1/14*

U.S. Cl. 219–69 G 10 Claims



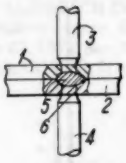
A servomechanism feed system providing delayed "triggered" backup in combination with an automatic velocity control. The system permits high velocity approach of a movable object, and retract and automatic damping of velocity for

stable operation thereby relieving the operator from manual search for desired conditions. Approach means operates in response to an input signal and at low velocity stabilizes near desired conditions. Backup or retract signal is "transistor triggered" only after high velocity overshoot of the reference signal. At this time complementary transistors or other electronic control devices shunting the output become conductive to reduce the velocity and give stable operation.

3,721,796
WELDING ELECTRODES

Alan Reed, Sydney, Australia, assignor to Plessey Handel Und Investments A.G., Zug, Switzerland

Filed Dec. 2, 1971, Ser. No. 204,041
Claims priority, application Great Britain, Dec. 31, 1970, 61,978/70
Int. Cl. B23k *11/30*
U.S. Cl. 219—119 3 Claims

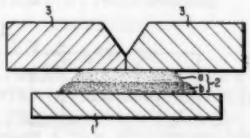


A welding electrode for the electrical resistance welding of zinc and/or tin coated metal including a body member of copper or a copper-base alloy having an electroless nickel/phosphorus alloy coating on a welding face or faces thereof. The preferred electrode material is beryllium-copper and the thickness of the electroless nickel/phosphorus alloy coating is preferably in the range 0.0001 inches to 0.010 inches.

3,721,797
WELDING PROCESS AND PLURAL LAYERED BACKING MATERIAL

Masayasu Arikawa and Motomi Kano, Fujisawa, and Naoki Okuda, Kamakura, Japan, assignors to Kobe Steel, Ltd., Kobe, Japan

Filed Mar. 18, 1970, Ser. No. 20,657
Claims priority, application Japan, Mar. 25, 1969, 44/22,587; Dec. 4, 1969, 44/97,458
Int. Cl. B23k *9/02*
U.S. Cl. 219—137 6 Claims

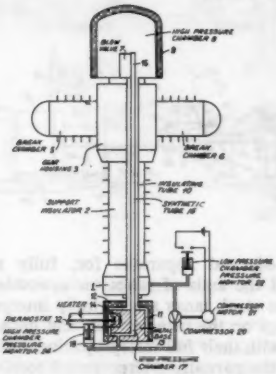


A single-side welding process is facilitated by the use of a flux material which is held against the back of the workpieces to be joined by a copper backing strip. At least 40% by weight of the flux is in particulate form having a particle size of less than 840μ. The flux also contains a binder material which is fusible under the influence of the arc heat.

3,721,798
PRESSURE GAS SWITCH

Joachim Beierer, Berlin, Germany, assignor to Siemens Aktiengesellschaft, Berlin, Germany

Filed Feb. 24, 1971, Ser. No. 118,354
Claims priority, application Germany, March 3, 1970, P 20 10 690.5
Int. Cl. H05b *1/00*
U.S. Cl. 219—209 6 Claims

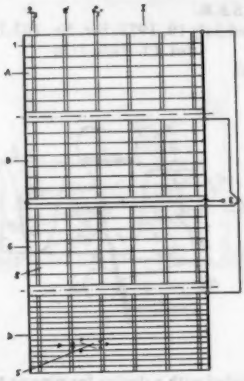


The heater of a pressure gas switch is switched on and off by a regulating device which operates in accordance with the pressure of quencher gas in a closed gas cycle system. A decrease in the pressure switches the heater on and an increase in the pressure switches the heater off. The quencher gas is preferably sulphur hexafluoride.

3,721,799
ELECTRIC HEATING SOURCE FOR SEATS AND MATTRESSES AND METHODS OF APPLICATION OF THE SAME

Ruben Carlstrom, Alstromersgaten 9, 44100 Alingsas, Sweden

Filed Oct. 20, 1970, Ser. No. 82,345
Claims priority, application Sweden, Oct. 22, 1969, 14440/69
Int. Cl. H05b *1/00*
U.S. Cl. 219—212 4 Claims



The electric heating source of the invention is a fabric provided with parallelly interwoven groups of resistance wires transversed by parallelly interwoven groups of conducting wires, both kinds of wires thereby forming electrical contacts with each other. The resistance wires are interrupted, in the

fabric, to form current circuits in which the transversely interwoven wires are connected to conductive feeder wires which are connected to a suitable current supply.

3,721,800
ELECTRICAL HEATING FILM

Paul Eisler, 57 Exeter Rd., London, N.W. 2, England

Division of Ser. No. 590,400, Oct. 28, 1966, Pat. No. 3,539,767, which is a division of Ser. No. 165,736, Jan. 12, 1962, Pat. No. 3,283,284. This application Oct. 26, 1970, Ser. No. 84,101

Claims priority, application Great Britain, Jan. 20, 1961, 2,384/61

Int. Cl. H05b *1/00*

U.S. Cl. 219—213 **24 Claims**

Space heating means and method having an electric resistance heating film comprising a meander pattern of conductive foil with terminals at least in part integral and of lower resistance than the pattern. The film may be disposed between two layers of which one is a floor or wall covering and the film being bonded to one of the layers and having at least one of the layers composed of a material supplied in roll form and laid in parallel adjacent lengths over a floor or wall surface and metallic strips connecting the heating film to a low voltage supply source.

3,721,801
AUTOMATIC SEALER CONTROL

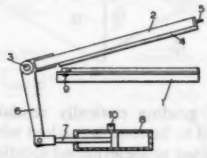
Frederick Douglas Clavell Bate, 155 Barkerhouse Road, Nelson, England

Continuation-in-part of application Ser. No. 611,420, Jan. 24, 1967. This application Aug. 26, 1969, Ser. No. 871,425

Claims priority, application Great Britain, Jan. 22, 1966, 3,012/66

Int. Cl. H05b *1/00*

U.S. Cl. 219—243 **14 Claims**



Strip or sheet of plastic film is folded and the plies sealed together to form envelopes by a sealing head having an intermittently heated exposed sealing element. The duration of application of the sealing element to the film is automatically controlled according to the temperature of the sealing element, the sealing head being power operated to remove the sealing element from the film when the sealing element reaches a predetermined temperature.

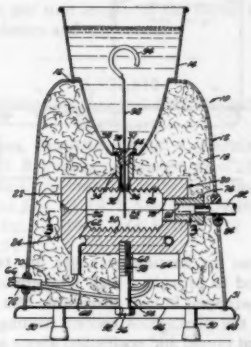
3,721,802
STEAM GENERATOR

Ernest L. Chrisman, Downey, Calif., assignor to Nordic Cloud Corporation, El Monte, Calif.

Filed Jan. 17, 1972, Ser. No. 218,232

Int. Cl. F22b *1/28*

U.S. Cl. 219—273 **5 Claims**



A portable, freestanding, fully automatic ancillary steam generator unit for use with sauna baths, steam rooms, or the like. The steam generator is disposed exteriorly of the sauna bath or steam room and comprises a housing, a body having an electrically heated, thermostatically controlled internal steam chamber disposed within and insulated from the housing, a water reservoir and a connector element for interconnecting the steam chamber and the water reservoir and for metering the flow of water to the steam chamber. The upper and lower walls of the steam chamber are provided with a plurality of uniformly spaced, generally V-shaped grooves for efficiently dispersing and vaporizing the water entering the steam chamber.

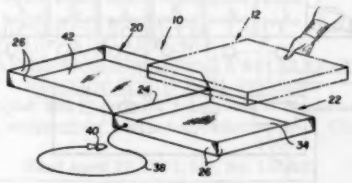
3,721,803
PIZZA PIE WARMING CARRIER

Alfred DiStefano, 606 Plainview Road, Plainview, N.Y.

Filed March 16, 1971, Ser. No. 124,772

Int. Cl. A21b *1/52*; F27d *11/02*

U.S. Cl. 219—387 **4 Claims**



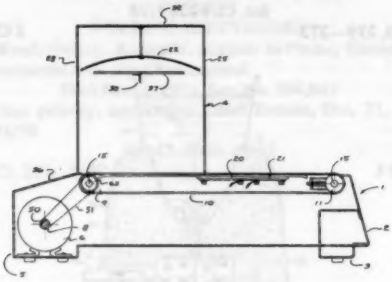
A warming carrier for a cardboard boxed pizza pie including an electric heating source to maintain the elevated temperature of the pizza pie and also the vapor state of moisture within the box and formerly on the pizza pie, and a silver foil condensing surface adjacent the upper cardboard box wall to condense said vapor and contribute to causing absorbing contact of the same with said upper cardboard wall. As a consequence, the pie crust is prevented from becoming undesirably soggy and moisture laden.

3,721,804

APPARATUS FOR SEALING AND SHRINKING PLASTIC FILM

Rubin Feldman, Creve Coeur, Mo., assignor to Tsi, Inc., St. Louis, Mo.

Filed Dec. 16, 1970, Ser. No. 98,740
Int. Cl. B65b *53/02*; F27b *9/10*
U.S. Cl. 219—388 **13 Claims**



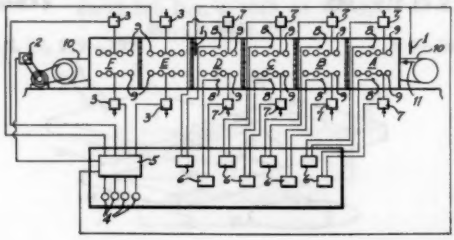
An apparatus for heating packages has two heating elements arranged to provide a high temperature environment for packages wrapped in heat shrinkable film. A first heating element seals the package. A second heating element is enclosed in a heat tunnel and positioned above and laterally displaced from the first element. Heat is directed downwardly by a reflector or by a reflector-fan combination. A belt conveyor carries packages over the first heating element and through the heat tunnel. The conveyor has a lengthwise protrusion along its interior surface, through the full length of the closed belt. Spring loaded rollers at each end of the conveyor have annular notches or channels the sides of which engage the protrusion and prevent belt slippage.

3,721,805

OVEN CONTROL

John Barratt, Newton-le-Willows, England, assignor to Simon-Vicars Limited, Earlestown, Newton-Le-Willows, England

Filed Jan. 20, 1972, Ser. No. 219,453
Claims priority, application Great Britain, Feb. 11, 1971, 4494/71
Int. Cl. H05b *1/02*
U.S. Cl. 219—492 **12 Claims**



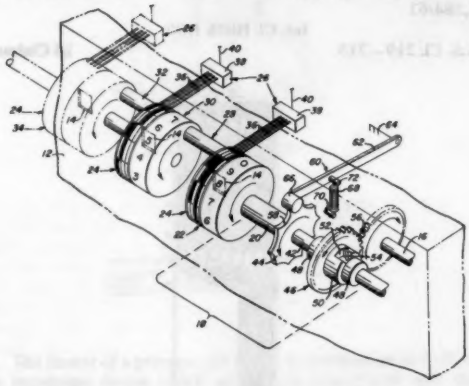
A heat supply control means for a baker's oven through which products to be baked are carried from one end to the other on a travelling conveyor and which is divided into a plurality of zones, said heat supply control means comprising adjustable heat supply means in each zone, thermostatic temperature control means for controlling the heat input to all of said zones except one or more final zones at the downstream end of the oven, and means associated with said final zone or zones for controlling automatically the heat supply means thereto such that the radiation produced therein is sufficient when products to be baked are passing therethrough to ensure required texture and color.

3,721,806

DIGITAL ENCODER FOR MECHANICAL COUNTERS

David C. Stothart, Cheswick, Pa., assignor to Gulf Reserarch & Development Company, Pittsburgh, Pa.

Filed Nov. 26, 1971, Ser. No. 202,446
Int. Cl. G06m *1/00*; G06c *27/00*; G06f *7/38*
U.S. Cl. 235—61 PD **9 Claims**



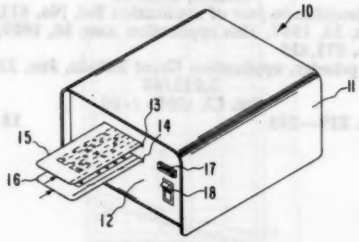
A supplemental read-out for a mechanical counter comprising fingers for sensing coded patterns on the numeral wheels and for transmitting electrical signals corresponding to the sensed coded pattern to remote electronic equipment. An incremental drive is also provided at the input end of the first counter wheel to eliminate errors which might arise from the wheel stopping between two numbers.

3,721,807

CARD GRADING MACHINE

Daniel D. Miller, Sunnyvale, and Donald D. Miller, Saratoga, both of Calif., assignors to Miller Scientific Corporation, Los Gatos, Calif.

Filed Oct. 20, 1971, Ser. No. 190,732
Int. Cl. G06k *5/00*; G09b *7/06*
U.S. Cl. 235—61.6 E **10 Claims**

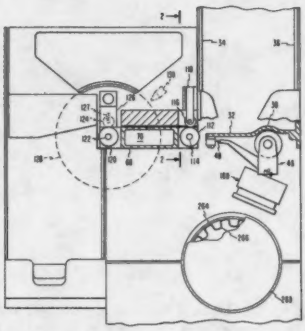


Apparatus for grading optically readable answer cards wherein each card to be read is marked with optically readable marks in selected predetermined locations, the apparatus comparing a marked answer card with a correctly marked master card also having optically readable marks in the locations corresponding to the correct selection of predetermined locations on the answer card. A transport carries two arrays of photosensors for simultaneously optically reading both the master card and the answer card, and comparing the readings obtained thereby.

3,721,808
PNEUMATIC DOCUMENT CARD READER

Roger F. Dimmick; Richard E. Lagergren; Robert F. Markley; Merlin J. Ricklefs, and Walter S. Schaffer, all of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 22, 1971, Ser. No. 211,018
Int. Cl. G06k 7/02; B65h 1/06, 31/00
U.S. Cl. 235—61.11 J 13 Claims

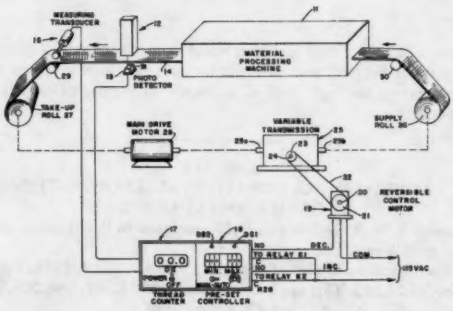


A reader for document cards having a read station with a pneumatically actuated electric switch assembly which is easily removable from the reader by swinging the assembly upwardly out of detentheld position and then detaching the assembly from a multiple contact socket. The cards are fed to the read station from a hopper having document card pick rolls on its bottom which are moved into card picking position by a pneumatic actuator releasably held in a carrier from which the actuator may be easily removed for replacement. The pick rolls are carried by a swinging carrier in which the rolls are releasably held under spring pressure for easy replacement. The reader includes a stacker with a stacker full switch held by a pair of pins from which the switch may be detached for easy replacement.

3,721,809
AUTOMATIC THREAD COUNTER AND CONTROLLER FOR FABRIC PROCESSING APPARATUS

Charles F. Strandberg, Jr.; Robert C. Strandberg, both of Greensboro, and James M. Gee, Silver City, all of N.C., assignors to Strandberg Engineering Laboratories, Inc., Greensboro, N.C.

Filed April 5, 1971, Ser. No. 131,040
Int. Cl. G07c 3/10
U.S. Cl. 235—92 PD 7 Claims

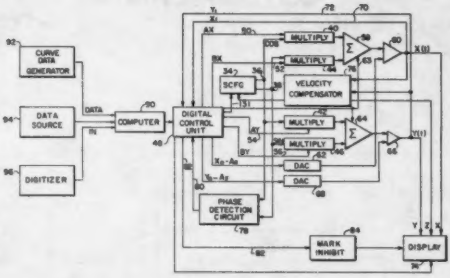


Apparatus for counting threads in a moving fabric comprising a laser source of light radiations for direct penetration of the fabric, a photo detector activated by the light radiations passing through the fabric for producing electrical signal variations caused by successive threads passing through the light radiations and a thread counter actuated by the electrical signal variations. A fabric length measuring transducer is provided to measure the fabric while the threads are being counted and to produce length related pulses which are used to control the thread counter so that the thread counter will indicate threads per unit length of fabric. Automatic control means is provided which will adjust the speed of a fabric supply roll relative to a fabric delivery roll in accordance with the thread count per unit length indicated by the thread counter in order to stretch or shrink the fabric and thereby adjust the threads per unit length of the fabric to be within a preselected minimum and maximum.

3,721,810
DISPLAY SYSTEM UTILIZING ONE OR MORE CONIC SECTIONS

Luis F. Villalobos, Brookline; Allen A. Harano, Watertown, and Richard H. Breinlinger, Concord, all of Mass., assignors to Conographic Corporation, Cambridge, Mass.

Filed Jan. 13, 1971, Ser. No. 106,108
Int. Cl. G06g 7/48; H01j 29/52
U.S. Cl. 235—151 24 Claims



An electronic display system for producing a visual line image as a sequence of elliptical curve sections displayed under the control of efficiently generated orthogonal time varying signals. The orthogonal signals are generated as combinations of preferably quarter cycle sine and cosine function electrical signals specified by a minimum of easily calculated parameters which become control inputs to a signal generator. Digital control circuitry governs overall display operation. Means are provided to compensate for variations in the display intensity produced by variations in cathode-ray-tube writing speed.

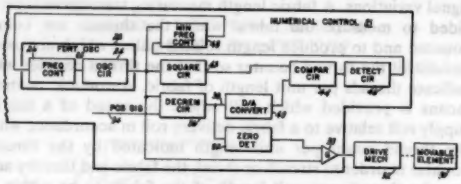
3,721,811
APPARATUS FOR COMMANDING A DECELERATION IN NUMERICAL CONTROL SYSTEMS

Ian K. Taylor, and Maurice R. Jones, both of Biggleswade, England, assignors to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed April 29, 1971, Ser. No. 138,597
Int. Cl. G06f 15/46
U.S. Cl. 235—151.11 4 Claims

An apparatus for commanding deceleration of a driving mechanism at a point along a path permitting the driving mechanism to position a load at a predetermined end point in the minimum time. The driving mechanism is responsive to a plurality of pulses having a frequency defining velocity along the path. A circuit is provided having an input responsive to the plurality of pulses and producing an output signal as a function of the square of the input, i.e., path velocity. This signal is compared with a position signal representing the untraversed distance along the path. When the difference

between these two signals reaches a predetermined value, e.g., zero, a detection circuit produces a deceleration signal commanding a predetermined rate of decrease in he frequency of



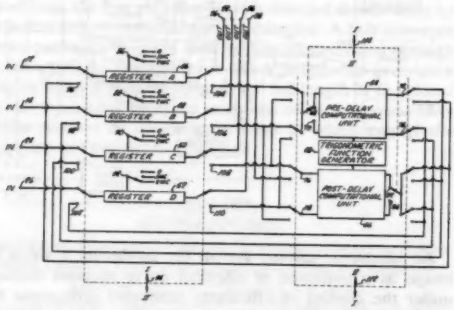
the plurality of pulses. Thus the driving mechanism decelerates and brings the load to the predetermined end point in the minimum time.

3,721,812

FAST FOURIER TRANSFORM COMPUTER AND METHOD FOR SIMULTANEOUSLY PROCESSING TWO INDEPENDENT SETS OF DATA

Ralph Otto Schmidt, Santa Ana, Calif., assignor to Interstate Electronics Corporation, Anaheim, Calif.

Filed March 29, 1971, Ser. No. 128,915
Int. Cl. G06f *7/38, 15/34*
U.S. Cl. 235—156 **22 Claims**



Special purpose computing equipment is utilized to perform the Fast Fourier Transform algorithm. The computing equipment utilizes serial access memory for storing coefficients during interim periods between calculations and by properly alternating between two clock rates for the serial memory, the computer allows the processing of two Fast Fourier Transform algorithms simultaneously when the input data for the two algorithms is in different binary order.

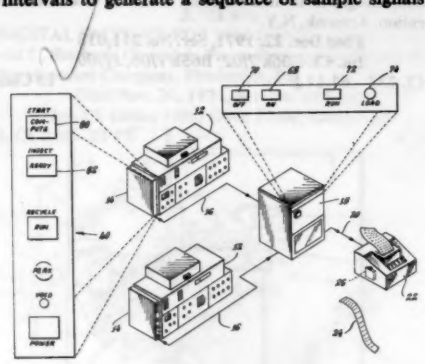
3,721,813

ANALYTICAL INSTRUMENT SYSTEM

Richard D. Condon and Harry A. Gill, Ridgefield, David J. Noonan, Old Greenwich, and Gerard T. Paul, Weston, Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Feb. 1, 1971, Ser. No. 111,593
Int. Cl. G06f *7/74;* G01n *31/08*
U.S. Cl. 235—151.35 **6 Claims**

An analytical instrument system includes a plurality of gas chromatographic analytical instruments that produce analog output signals having voltage peaks that extend from a baseline. A plurality of voltage-to-frequency converters are coupled to corresponding analytical instruments to convert the voltage output signals thereof to pulses having a pulse repetition rate corresponding to the amplitudes of the analog signals. Dedicated circuits including a plurality of counters are coupled to corresponding ones of the voltage-to-frequency converters to count the output pulses therefrom. A data processor is provided for responding to the stored data in said counters. The data processor includes means for sampling the counters at intervals to generate a sequence of sample signals cor-



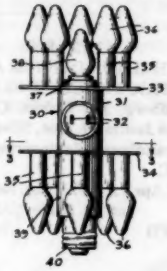
responding to the analog output signals of corresponding analytical instruments. A program is stored in the memory of the data processor for analyzing the sample signals to derive the time of occurrence of the peaks in the analog signals as well as their areas.

3,721,814

LIGHT UNIT

Gordon E. Ries, 4423 Third Ave., East Bradenton, Bradenton, Fla.

Filed Aug. 9, 1971, Ser. No. 169,929
Int. Cl. F21p *1/02*
U.S. Cl. 240—10 R **1 Claim**



In a light unit that includes a plurality of sockets for receiving bulbs therein, and wherein there is provided a means for connecting the light unit to a source of supply of electrical energy.

3,721,815

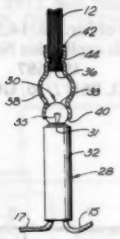
ACYLINDRICAL ORNAMENTAL ILLUMINATION DEVICE AND ADAPTER

Lamar J. Wall, Seal Beach, Calif., assignor to Poly-Optics, Inc., Santa Ana, Calif.

Continuation-in-part of Ser. No. 27,064, April 9, 1970, Pat. No. 3,624,385. This application Dec. 1, 1971, Ser. No. 203,774
Int. Cl. F21v *17/04*
U.S. Cl. 240—10 R **9 Claims**

An adapter is provided whereby a spray of optical fibers can be readily connected or disposed in proximity to a light source

by means of an acylindrical casing therefor. A plurality of optical fiber sprays are connected for illumination by the light



bulbs on a string of light bulbs which may then be used for decorating a Christmas tree or the like.

3,721,816

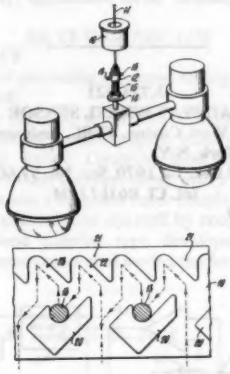
LUMINAIRE

Robert D. Zeller, Newark, Ohio, assignor to Holophane Company, Inc., New York, N.Y.

Filed June 18, 1971, Ser. No. 154,322

Int. Cl. F21v *21/38*

U.S. Cl. 240—64 **3 Claims**



A lighting fixture having a mast upon which a mount carrying one or more luminaires is supported and upon which the mount can be raised and lowered. To hold the mount in position on the top of the mast there is provided a latch mechanism which is operable automatically by a hoisting line upon which the mount is raised and lowered.

3,721,817

RECESSED LIGHTING FIXTURE

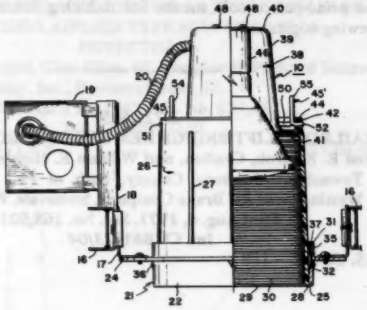
James Contratto, San Leandro, Calif., assignor to U. S. Industries, Inc., New York, N.Y.

Filed Oct. 7, 1970, Ser. No. 78,875

Int. Cl. F21v *27/00*

U.S. Cl. 240—73 BC **4 Claims**

A lighting fixture adapted to be semi or completely recessed within a wall of a building structure and especially within a ceiling wall thereof. The lighting fixture includes a plaster flange structure adapted to be secured within the building wall and having a ring-shaped collar extending through an opening provided in the wall for this purpose. A hollow axially elongated baffle housing extends through the collar and is held in place with respect thereto by spring retainer means fixedly secured to the collar and resiliently gripping the baffle housing. At its inner end, the baffle housing is connected with a socket cap which closes the same and provides a connector socket adapted to receive the base of a light bulb therein. A



spring fastener releasably interconnects the socket cap and baffle housing; and access into the interior of the fixture for bulb replacement is provided both inwardly through the ceiling wall, as by withdrawal of the baffle housing and socket cap therefrom through the plaster ring structure, and from within the interior of the building wall by removal of the socket cap from the baffle housing.

3,721,818

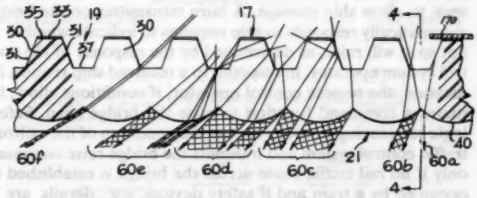
CEILING MOUNTED LUMINAIRE AND LIGHT-TRANSMITTING ENCLOSURE THEREFOR

Leo G. Stahlhut, Kirkwood, Mo., assignor to K-S-H, Inc., St. Louis, Mo.

Filed May 18, 1970, Ser. No. 38,238

Int. Cl. F21v *5/02, 5/04*; F21s *3/00*

U.S. Cl. 240—106 R **39 Claims**



A light transmitting enclosure for a ceiling mounted lighting fixture provides novel lighting patterns heretofore obtainable, if at all, only with reflectors and baffles. In the preferred embodiments, the light distribution pattern is a batwing pattern which reduces both direct and reflected glare. In a preferred embodiment, a lenticular pattern on the lower face of a horizontal reach of the enclosure enlarges a pattern of up-

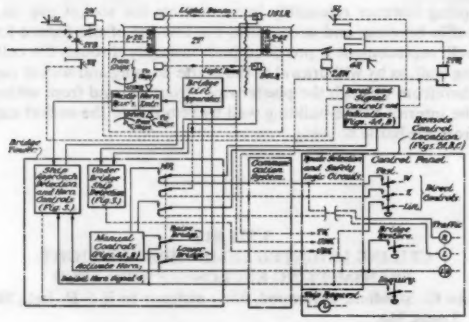
wardly convergent protrusions having light reducing upper surfaces which form a light reducing pattern on the upper surface of the reach directly above the lenticules, to reduce luminance at viewing angles near the nadir; the lenticular pattern also cuts off high angle luminance to complete the batwing pattern. In other embodiments the light reducing pattern is provided directly on a flat upper face of the reach. In other embodiments the pattern is positioned relative to the lenticules to provide different lighting patterns. In still other embodiments the upwardly convergent protrusions provide the principal or sole means for reducing luminance at low viewing angles.

3,721,819

RAILROAD LIFT BRIDGE REMOTE CONTROL SYSTEM

Fred E. Samrok, Crafton, and William E. Higgins, Penn Hills Township, Allegheny County, both of Pa., assignors to Westinghouse Air Brake Company, Swissvale, Pa.

Filed Aug. 4, 1971, Ser. No. 168,921
Int. Cl. B61l *23/04*
U.S. Cl. 246—118 **8 Claims**



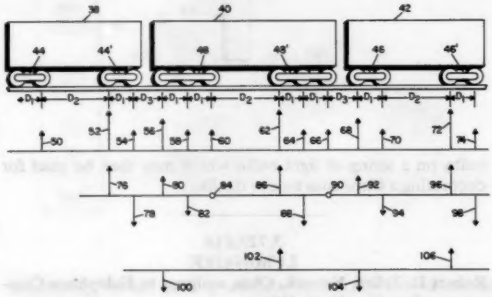
Apparatus at the lift bridge receives whistle signals from approaching ships and records requests for raising the bridge span to allow ship passage. A horn transmitter on the bridge automatically responds to ship requests to indicate whether or not span will raise, as determined by the response of the control system operator. In response to a received ship request indication, the remote control operator, if conditions allow, initiates a command function to raise the bridge span. Safety logic sequencing circuitry checks the condition of the railroad traffic control system and transmits the bridge raise command only if no rail traffic route across the bridge is established or occupied by a train and if safety devices, e.g., derails, are in their blocking positions. The bridge lift apparatus properly sequences the actions necessary to raise and lower the bridge, including rail unlock and locking and starting and stopping the span, when the corresponding command function is received. Remote operator selection of a rail traffic route across the bridge initiates the safety logic circuitry sequence to lower the bridge, if up, and to then establish derail and signal conditions for train movement. Under-bridge ship detectors prevent lowering the span upon a ship occupying that space. When span-seated and rails-locked indications are received and checked, the safety logic circuitry closes the derails and subsequently clears the proper signal for the desired train movement.

3,721,820

COMPUTING CAR LOCATIONS IN A TRAIN

Paul W. Caulier, Greenwood, and Donald W. Greene, Fishersville, both of Va., assignors to General Electric Co., Salem, Va.

Continuation-in-part of Ser. No. 14,574, Feb. 26, 1970, Pat. No. 3,646,343. This application Nov. 17, 1971, Ser. No. 199,687
Int. Cl. B61l *1/16*; G06f *7/02*
U.S. Cl. 246—247 **8 Claims**



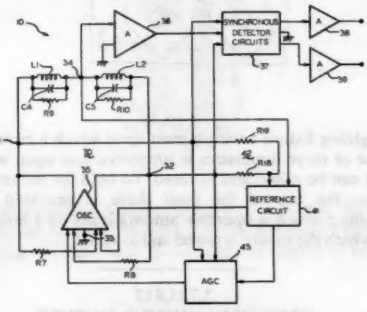
A novel method and apparatus is disclosed for measuring the successive distances between the wheels of cars in a train and processing said measurements to locate a given axle of a car, such as the first axle of a truck of a car or the first axle of the car.

3,721,821

RAILWAY WHEEL SENSOR

Carl G. Blanyer, West Covina, Calif., assignor to Abex Corporation, New York, N.Y.

Filed Dec. 14, 1970, Ser. No. 97,602
Int. Cl. B61l *13/04*
U.S. Cl. 246—249 **12 Claims**

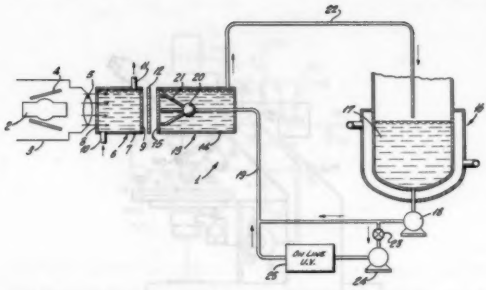


A railway wheel sensor, for detecting passage of a railway wheel, comprising two tuned pickup coils of large surface area having vertically oriented axes, spaced longitudinally of a railway rail with magnetic fields through which the wheel flange passes successively, the coils being connected in a bridge circuit excited by a high frequency signal, and a synchronous detector coupled to the bridge and to the excitation source, all mounted in a small, compact non-magnetic housing.

3,721,822
PHOTOCHEMICAL REACTOR

Arthur E. Klink, Lebanon, and Edward L. Paul, Fanwood, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jan. 17, 1972, Ser. No. 218,401
Int. Cl. G01n 21/26
U.S. Cl. 250—43.5 7 Claims



Impinging jet tubular photochemical reactor system.

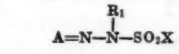
3,721,823
COLOR RADIOGRAPHY

Jan August Van Lishout, Kontich, and Jan Jaeken, Hove, both of Belgium, assignors to Agfa-Gevaert N.V., Mortsel, Belgium

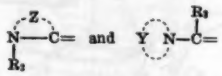
Filed Aug. 22, 1969, Ser. No. 852,236
Claims priority, application Great Britain, Aug. 22, 1968, 40,246/68
Int. Cl. G03c 7/00, 1/76
U.S. Cl. 250—65 F 4 Claims

1. A method of producing a colored radiograph which comprises the steps of:

1. image-wise exposing to directly or indirectly recordable penetrating radiation a photographic material comprising at least one silver halide emulsion layer containing silver chloride in an amount corresponding with 5 to 16 g of silver nitrate per sq. m and a colorless color coupler which forms an azomethine- or quinonimine dyestuff by coupling with an oxidized p-phenylene diamine type developing agent and a colorless hydrazone compound having the formula



wherein A has one of the structural formulas



R_1 is a hydrogen atom or an acyl radical,
R_2 is an alkyl radical or an aryl radical,
R_3 is a hydrogen atom, an amino radical, an alkyl radical, an alkylene radical, an aryl radical or a heterocyclic radical,
X is a hydroxyl radical, an amino radical, an alkyl radical, an aryl radical, and a heterocyclic radical,
Y represents the non-metallic atoms necessary to complete a nitrogen-containing heterocyclic nucleus, and
Z represents the non-metallic atoms necessary to complete a heterocyclic nucleus containing five to six members, at least one of which is a nitrogen atom,

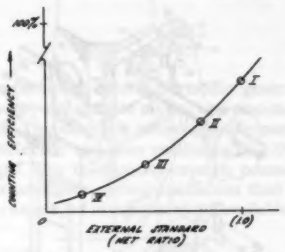
2. color developing the exposed silver halide with a p-phenylene diamine type developing agent to produce in the exposed areas of said emulsion layer an image of said azomethine or quinonimine dyestuff, and

3. removing the silver metal produced during said development with an alkaline oxidizing bleaching solution effecting the oxidative coupling of said hydrazone compound with said colorless color coupler left in the unexposed areas, said color coupler and hydrazone compound being adapted upon such coupling to form a dye image of substantially contrasting color and opposite gradation to the first developed dye image.

3,721,824
APPARATUS AND METHOD FOR ADJUSTING GAIN OF PHOTOMULTIPLIER TYPE SCINTILLATION DETECTORS

Stanley M. Bristol, Glen Ellyn, Ill., assignor to Packard Instrument Company, Inc., Downers Grove, Ill.

Filed April 10, 1967, Ser. No. 629,462
Int. Cl. G01t 1/20
U.S. Cl. 250—71.5 R 22 Claims

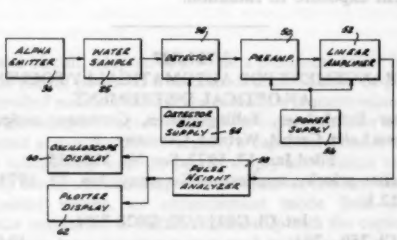


Photomultiplier type scintillation detectors are normalized, or adjusted to constant gain characteristics, independent of the high voltage applied to the photomultiplier. The normalized photomultiplier circuit is particularly useful in coincidence counting in liquid scintillation spectrometry, especially where the circuit is of the summation type. The inventive system has special application to apparatus for externally standardizing the spectrometer output to compensate for sample quench effects.

3,721,825
METHOD AND APPARATUS FOR ANALYSIS OF LIQUID RESIDUES USING NUCLEAR REACTIONS

John Oscar Rasmussen, Jr., 207 Armory Street, Hamden, Conn.

Filed Dec. 3, 1970, Ser. No. 94,829
Int. Cl. G01t 1/16
U.S. Cl. 250—83.3 R 32 Claims



Herein described is the method and apparatus for irradiating a liquid residue sample with alpha particles and detecting the protons liberated from the nuclei of sample constituents. Pulse height energy analysis of detected protons provides characteristic signatures indicative of certain elements contained in the sample. The energy of the alpha particle source and the thickness of the sample are selected to reduce inter-

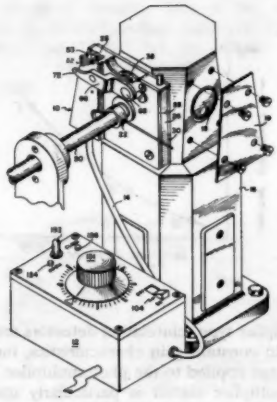
fering signatures. A tape transport mechanism incorporated into one preferred embodiment allows the retention of samples for subsequent additional testing and provides a permanent record. Means are provided for automatically performing the analysis, for controlling processing systems in response thereto and/or for telemetering the analysis data to a remotely located processing or record center.

3,721,826

FAIL-SAFE HIGH-ENERGY RADIATION SHUTTERING APPARATUS

Roy L. Thomas, Jr., Medway, Mass., assignor to Charles Supper Company, Incorporated, Natick, Mass.

Filed Aug. 5, 1970, Ser. No. 61,292
Int. Cl. G21f 5/04; H01j 35/16
U.S. Cl. 250—105 **16 Claims**



Shuttering apparatus for controlling and signaling of the passage of high-energy radiation is disclosed as including a shutter containing a normally closed gate which is opened by energizing a solenoid actuator through a control circuit. The control circuit includes a novel interlock which prevents energization of the solenoid except when a beam-receiving means (a beam tunnel, for example) is properly interfaced with the shutter. An inerrant mechanical flag indicator is off-set from the gate and baffled in a novel manner to preclude escape of scattered radiation. The apparatus includes other safety features for maximizing user protection against accidental or inadvertent exposure to radiation.

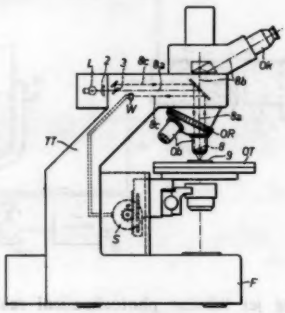
3,721,827

ARRANGEMENT FOR AUTOMATICALLY FOCUSSING AN OPTICAL INSTRUMENT

Gunter Reinheimer, Fellingshausen, Germany, assignor to Ernst Leitz, GmbH, Wetzlar, Germany

Filed Jan. 17, 1972, Ser. No. 218,335
Claims priority, application Germany, Jan. 22, 1971, P 21 02 922.1
Int. Cl. G01j 1/20; G02b 7/04
U.S. Cl. 250—201 **10 Claims**

In an optical instrument for viewing an illuminated object by means of an objective lens first reflecting means are provided for so reflecting a bundle of invisible light rays out of the illuminating light that the invisible light again enters the illuminating light in only one half of its cross section. The invisible light is then reflected back from the object into the respective other half of the cross section of the illuminating light where second reflecting means are provided for reflecting the invisible light onto a differential photoelectric means. A reference mark is arranged in the path of the invisible light before it is reflected from the object and an image of the reference mark is produced on the differential photoelectric means. A voltage is generated by the latter when the reference mark appears on one of the photoelectric elements constituting the differential photoelectric means, this being the case whenever the object is not in focus. A setting mechanism is provided which is actuated by the generated voltage for varying the distance between the object and the objective lens sufficiently for bringing the image of the reference mark into focus again.

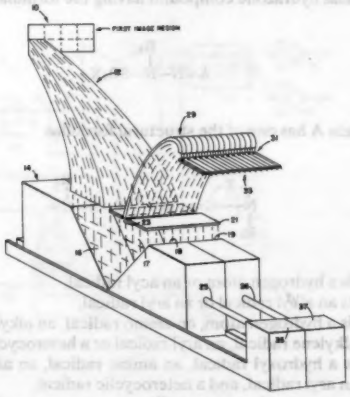


3,721,828

OPTICAL IMAGE SCANNER UTILIZING VARIABLE INDEX OF REFRACTION FIBER OPTICS

Jerry K. Parks, Los Altos Hills, Calif., assignor to The United States of America as represented by the Secretary of the Army

Filed Oct. 29, 1971, Ser. No. 193,812
Int. Cl. G02b 5/14; H01j 39/12
U.S. Cl. 250—220 R **2 Claims**

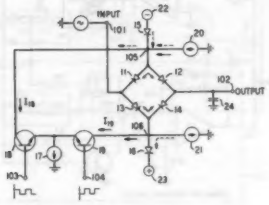


An array of the fiber optics are used to collimate divergent rays emanating from an image to be scanned. Scanning is then implemented by moveable mirrors located in the collimated beam region presented by the fiber optics. A linear array of detectors is arranged to sense the collimated rays as they pass by due to movement of the mirror.

3,721,829
AUTOBALANCED DIODE BRIDGE SAMPLING GATE

George Mead Benson, Matawan, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 23, 1971, Ser. No. 173,826
Int. Cl. H03k 17/00
U.S. Cl. 307—235 10 Claims

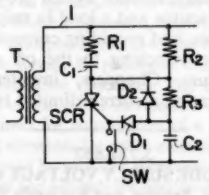


A diode bridge sampling gate includes a first feedback loop which automatically balances the gate drive current and thereby essentially eliminates any DC offset in the output. This first feedback loop comprises a dual output current source which supplies current to the control terminals and an operational amplifier which compares the gate bias voltages and uses the comparison to control the dual output current source in such a way as to balance these bias voltages. A second feedback loop may also be included, which maintains one of the gate bias currents at a constant value independent of nominal power supply variations. This reduces the sensitivity of the gate current balance to the tracking of the outputs of the dual current source.

3,721,830
PULSE DIP CARRIER SYSTEM USING AC DISTRIBUTION LINE

Hiroshi Oishi; Fumio Aoki; Shigeru Kawano, all of Chiyodaku, Tokyo; Setsuo Kikuta, and Masami Shirakawa, both of Shinagawaku, Tokyo, all of Japan, assignors to The Tokyo Electric Power Co. Inc. and Osaki Electric Co. Ltd., Tokyo, Japan

Filed June 18, 1971, Ser. No. 154,435
Int. Cl. G08c 19/24
U.S. Cl. 307—3 5 Claims

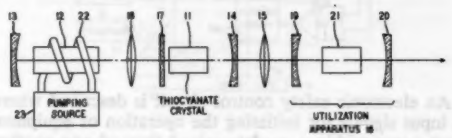


A pulse dip carrier system comprises a series circuit having an electronic switch and a capacitor and being connected in parallel to an AC distribution line, and a phase shifter circuit for controlling the electronic switch by the phase shifter output. The electronic switch closes under the control of the phase shifter circuit when the phase of the line voltage of AC distribution line to a point of the zero instantaneous value thereof comes to a predetermined angle, a charging current flows in the capacitor when the electronic switch is closed whereby steep pulse dip is generated on the wave of the line voltage.

3,721,831
OPTICAL SECOND HARMONIC GENERATORS EMPLOYING THIOCYANATE CRYSTALS

John George Bergman, Jr., Rumson; Glen Robert Crane, Scotch Plains, and James Hoffman McFee, Colts Neck, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed July 16, 1971, Ser. No. 163,321
Int. Cl. H02m 5/06
U.S. Cl. 307—88.3 2 Claims

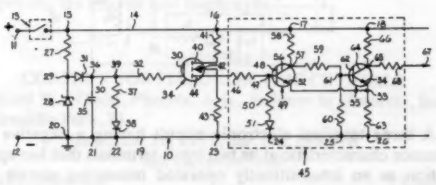


The disclosed optical second harmonic generator uses a cadmium-mercury thiocyanate crystal or a zinc-mercury thiocyanate crystal. This device is advantageously pumped with a neodymium dielectric rod laser oscillating at 1.06 micrometers wavelength. The thiocyanate crystals possess about 30 percent larger nonlinear optical coefficient than the lithium iodate crystals employed in commercially available devices.

3,721,832
TIME DELAY AFTER DE-ENERGIZATION CIRCUIT

Art Lee, El Paso, Ill., assignor to General Electric Company, New York, N.Y.

Filed March 29, 1972, Ser. No. 239,282
Int. Cl. H03k 17/28
U.S. Cl. 307—141 10 Claims

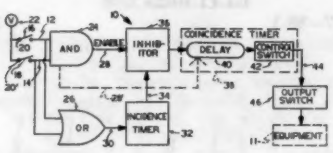


A timer circuit, adapted to provide a preselected time interval after loss of power to it to control reapplication of power to controlled means if the outage exceeds a predetermined interval, including a direct current power supply, resistor means connected across the power supply, a capacitor connected in circuit relationship with the power supply and resistor means whereby the rate of discharge of the capacitor is controlled by the resistor means, an enhancement mode field effect transistor connected in circuit relationship with the capacitor and a voltage level detector means such as to provide a linear output to the voltage level detector means corresponding to the charge existing on the capacitor, and wherein in accordance with one form of the invention the enhancement mode field effect transistor comprises a metal oxide semiconductor field effect transistor and the voltage level detector means comprises a Schmitt trigger circuit consisting of first and second transistors connected in circuit relationship with their associated resistors.

3,721,833
ELECTRONIC INCIDENCE AND COINCIDENCE SAFETY CONTROL CIRCUIT

George C. Kramer, Danbury, Conn., assignor to Branson Instruments, Incorporated, Stamford, Conn.

Filed Aug. 30, 1971, Ser. No. 175,927
Int. Cl. H01h 47/00; H03k 5/20
U.S. Cl. 307—232 7 Claims

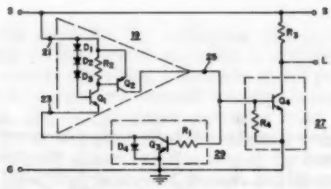


An electronic safety control circuit is described wherein input signals for initiating the operation of equipment must occur within a predetermined time of one another. A pair of delay circuits are employed which are energized in response to switch closures. One of the delays is connected to delay equipment operation until the circuitry has decided whether the input signals occurred within the time period set by the other delay. A failure of the input signals to occur during the prescribed time prevents equipment operation.

3,721,834
STORED ENERGY REGULATING CIRCUIT

Robert A. Hirschfeld, Cupertino, Calif., assignor to Lithic Systems, Inc., Cupertino, Calif.

Filed June 30, 1971, Ser. No. 158,378
Int. Cl. H03k 3/00
U.S. Cl. 307—235 R 3 Claims



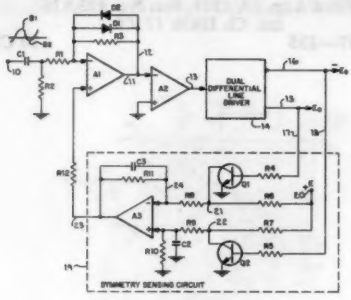
A three terminal electronic circuit having a negative resistance characteristic at its two input terminals that has application as an intermittently operated measuring circuit, an oscillator and other uses. A DC comparator circuit operates a power switch in series with a load in response to comparing the voltage at the input terminals with two distinct reference voltages, one reference voltage being utilized when the load power switch is off, and the other reference voltage being utilized when the load power switch is on. A load external of the circuit is connected between one of the input terminals and the circuit's third terminal. The load is operated from the input voltage to the circuit, thus requiring no separate power source for the load.

3,721,835
HARDLIMITER, AUTOMATIC SYMMETRY CIRCUIT

William J. Hess, Owego, N.Y., assignor to The United States of America as represented by the Secretary of the Navy

Filed Jan. 5, 1972, Ser. No. 215,503
Int. Cl. H03k 5/08
U.S. Cl. 307—237 4 Claims

A hardlimiter automatic symmetry control circuit having an amplified input and a dual differential line driver producing logic output with a symmetry sensing circuit in a negative feedback from the dual driven logic output to the amplifier input to convert output logic signals to a direct current (D.C.)

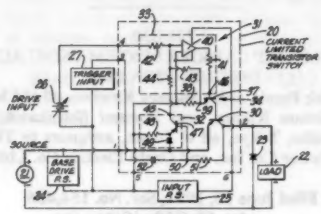


voltage of a polarity that is solely a function of the output symmetry to control the amplifier to maintain symmetry to logic signals in the output.

3,721,836
CURRENT LIMITED TRANSISTOR SWITCH

Wally E. Rippel, 5781 Valley Oak Drive, Hollywood, Calif. 90068

Filed Nov. 24, 1971, Ser. No. 201,671
Int. Cl. H03k 17/60
U.S. Cl. 307—253 22 Claims



A current limited transistor switch providing switching action between a source and a load in response to turn-on and turn-off signals, and providing current threshold sensing for automatic switching to the off condition when desaturation occurs. Choppers, inverters and circuit breakers incorporating a current limited transistor switch.

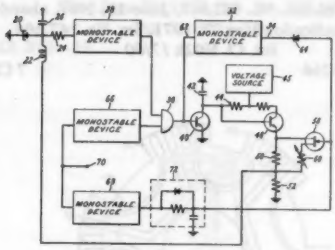
3,721,837
TUNNEL DIODE SUPPLY VOLTAGE CONTROL

Richard G. Trapani, Berwyn, and Benjamin Rolnick, Philadelphia, both of Pa., assignors to General Electric Company, New York, N.Y.

Filed July 6, 1971, Ser. No. 159,662
Int. Cl. H03k 17/00
U.S. Cl. 307—286 1 Claim

Supply or biasing voltage is applied to tunnel diode through long-time-constant supply circuit from source voltage higher than turn-on value at which diode displays negative resistance. Output pulse which results when bias approaches turn-on voltage, at which diode shows negative resistance, triggers monostable circuit which loads supply circuit (e.g., by discharging capacitor of RC circuit) for predetermined period, reducing bias on diode by finite amount. Second

monostable circuit, of longer output duration, temporarily reduces bias on diode below turn-off potential at which diode



resumes positive resistance in order that diode may operate just below turn-on voltage, well above turn-off voltage.

3,721,838

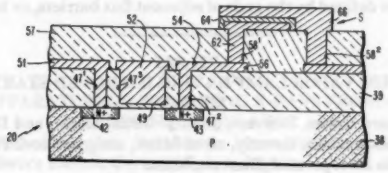
REPAIRABLE SEMICONDUCTOR CIRCUIT ELEMENT AND METHOD OF MANUFACTURE

Norman F. Brickman, and Leo B. Freeman, Jr., both of Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 21, 1970, Ser. No. 100,077

Int. Cl. H01l *19/00*

U.S. Cl. 307—303 **11 Claims**



A monolithic device is fabricated to permit electrical alteration thereof, whereby a circuit element or group of circuit elements therein may be substituted for other elements. An electrically alterable bistable element, typically an amorphous chalcogenide or amorphous metal-oxide, is suitably installed in the monolithic device by processes compatible with conventional semiconductor processes. The bistable element is connected in the circuit of the device and adapted to be electrically programmed for substitution of a circuit element or groups of circuit elements for other elements. The ability of a monolithic device to be repaired increases yields in manufacturing, lowers cost and extends the lifetime of such devices.

3,721,839

SOLID STATE IMAGING DEVICE WITH FET SENSOR

John Martin Shannon, Bosham, Chichester, Sussex, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed March 24, 1971, Ser. No. 127,596

Int. Cl. H01l *15/00, 11/14*

U.S. Cl. 307—304 **18 Claims**

A solid state imaging device is described. Junction FETs are employed as the sensors in a charge storage mode. In the non-illuminated condition, each FET has its channel blocked by a depletion region formed by pulsing the gate. Under illumination, the depletion region withdraws, opening up the channel. Each imaging FET element is sensed by pulsing its source or drain, following which its gate is pulsed to reblock the channel. Also, an integrated circuit version of the device, the

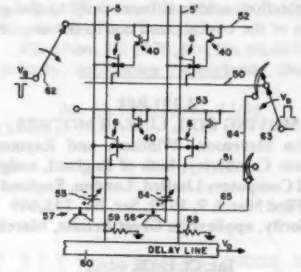


photo-JFETs having annular photo-gate regions and having a common substrate gate, the color response of the device being controlled by bias on the substrate gate.

3,721,840

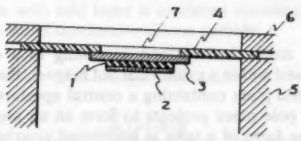
SOUND GENERATOR

Hayao Yamada, Kita-ku, Tokyo, Japan, assignor to Nittan Company, Limited, Tokyo, Japan

Filed Sept. 14, 1971, Ser. No. 180,397

Int. Cl. H04r *17/00*

U.S. Cl. 310—9.1 **1 Claim**



A sound generator having a relatively thin diaphragm and a piezoelectric disc element with electrodes bonded to opposing sides thereof adhered to one side of said diaphragm and means supporting the edge of said diaphragm.

3,721,841

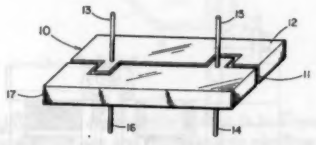
CONTACT FOR PIEZOELECTRIC CRYSTALS

Richard W. Wilson, Phoenix, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.

Filed June 16, 1971, Ser. No. 153,678

Int. Cl. H01v *7/00*

U.S. Cl. 310—9.4 **7 Claims**



There is disclosed a specialized composite contact for use with piezoelectric crystal frequency standards in which the contact area is minimized at the nodal points of the crystal so as to decrease damping of the crystal by the contacts and therefore increase its Q. The contacts are compatible with reflow soldering techniques thereby eliminating the compressive stress placed upon crystals by thermal compression bonding. Reflow solder is confined to the area of the contact by use of a patterned aluminum electrodes contacting the crystal. On the top of the aluminum electrodes are the composite contacts which are layered, with chromium being the layer next ad-

jacent the aluminum electrode followed by copper and then gold. These contact layers are deposited through a mask whose openings are positioned over the nodal points of the crystal and whose aperture sizes are limited such that contacts formed through this mask approach "point contact" characteristics. The reflow solder adheres only to the gold-copper outer portion of the contact and not to the aluminum metallization.

3,721,842

MOVING COIL LINEAR MOTORS

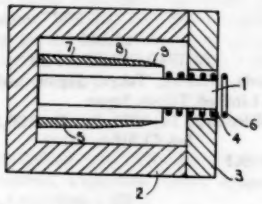
Timothy John Stevenson, Windsor, and Raymond Yardy, Yateley, near Camberley, both of England, assignors to International Computers Limited, London, England

Filed March 9, 1972, Ser. No. 233,049

Claims priority, application Great Britain, March 18, 1971, 07,157/71

Int. Cl. H02k *41/02*

U.S. Cl. 310—13 **6 Claims**



A linear motor is described consisting of a central pole piece disposed within a cylindrical pot magnet, the pot magnet having an end plate containing a central aperture into which the central pole piece projects to form an air gap. A magnet shield in the form of a tube is positioned coaxially with and spaced from the central pole piece and a coil is mounted for linear movement in a direction parallel to the axis of the pole piece in the air gap and in the space between the pole piece and the surrounding shield.

3,721,843

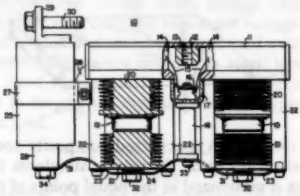
RECTIFIER ASSEMBLY FOR BRUSHLESS EXCITATION SYSTEMS

Andrew J. Spisak, Bethel Park, and Thayer L. Dillman, North Versailles, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 6, 1972, Ser. No. 232,085

Int. Cl. H02k *11/00*

U.S. Cl. 310—68 **12 Claims**



In a brushless excitation system rectifier diodes, heat sinks, capacitors, fuses and other circuit components are assembled in a modular assembly and a plurality of modules are mounted on support wheels and connected in a rectifier circuit to form a rotating rectifier assembly.

3,721,844

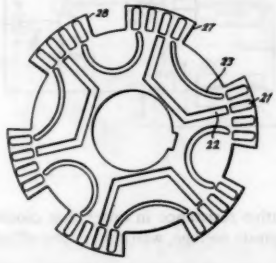
RELUCTANCE MOTORS

William Fong, Westbury-on-Trym, Bristol, England, assignor to National Research Development Corporation, London, England

Continuation of Ser. No. 832,663, June 12, 1969, abandoned. This application May 27, 1971, Ser. No. 147,604

Int. Cl. H02k *17/00*

U.S. Cl. 310—166 **7 Claims**



The rotor of a reluctance motor has a squirrel cage winding and flux barriers which follow the paths of direct axis flux between alternate pairs of poles but lie athwart the paths of quadrature axis flux. The number of flux barriers is equal to half the number of poles for which the stator is wound, but there are not less than three flux barriers. The angles subtended at the central axis of the rotor between the ends of each flux barrier and between the ends of adjacent flux barriers are all equal to each other. In addition auxiliary flux barriers may be provided which are embraced by the main flux barriers or extend between the ends of adjacent flux barriers, or both. Also circumferential grooves may be provided either in sectors defined by the end of the main flux barriers or in sectors defined by the ends of adjacent flux barriers, or both.

3,721,845

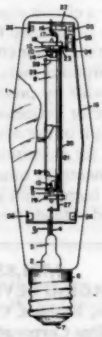
SODIUM VAPOR LAMP HAVING IMPROVED STARTING MEANS

Sheppard Cohen, Danvers; John J. Gutta, Salem, and Donald A. Richardson, Beverly, all of Mass., assignors to GTE Sylvania Incorporated, Danvers, Mass.

Filed June 28, 1972, Ser. No. 267,097

Int. Cl. H01j *7/24*

U.S. Cl. 313—15 **5 Claims**



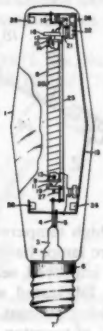
The arc tube of a sodium vapor arc discharge lamp has an external electrical heater spaced from but in heat transfer relationship therewith. The heater is made of refractory metal wire and is coiled around an insulating supporting rod. One end of the heater is connected to a wire that is wrapped around the arc tube near the end thereof that is opposite said heater end.

3,721,846

SODIUM VAPOR LAMP HAVING IMPROVED STARTING MEANS INCLUDING A HEATER

Sheppard Cohen, Danvers, Mass., assignor to GTE Sylvania Incorporated, Danvers, Mass.

Filed June 26, 1972, Ser. No. 266,294
Int. Cl. H01j 7/24
U.S. Cl. 313—15 2 Claims



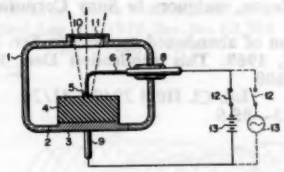
The arc tube of a sodium vapor arc discharge lamp has an external heater in heat transfer relationship with the arc tube and extending about the length of the arc tube. The ends of the heater are electrically connected to electrodes at the respective opposite ends of the arc tube in order to reduce the starting voltage of the lamp.

3,721,847

APPARATUS FOR PRODUCING X-RAYS FROM AN ELECTRIC INSULATOR

Michitaka Terasawa, Yokohama, Japan, assignor to Tokyo Shibaura Electric Co. Ltd., Tokyo, Japan

Filed Nov. 1, 1971, Ser. No. 194,379
Int. Cl. H01j 35/08
U.S. Cl. 313—55 14 Claims



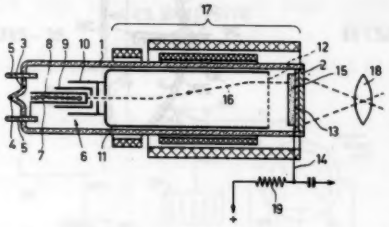
Apparatus for producing X-rays from an electric insulator. Two electrodes are disposed to contact the electric insulator. One electrode has a larger contact area with the insulator than that of the other. When a high D.C. or A.C. voltage is applied across the electrodes, the electric field becomes stronger in the portion of the insulator near the contact section with the small electrode, resulting in the production of X-rays from the vicinity of the contact section of the insulator with the small electrode.

3,721,848

CAMERA TUBE HAVING PHOTOCONDUCTIVE LEAD MONOXIDE LAYER ON SILICON CARBIDE SIGNAL PLATE

Wilhelmus Franciscus Knippenberg, and Gerrit Verspui, both of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 18, 1970, Ser. No. 90,493
Claims priority, application Netherlands, Dec. 19, 1969, 6919053
Int. Cl. H01j 29/45, 31/38
U.S. Cl. 313—65 A 2 Claims



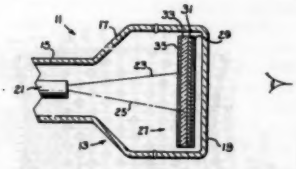
In order to ensure satisfactory durability of signal windows for use in electron tubes comprising a transparent substrate covered by a radiation-sensitive layer, the contact surface of the substrate with said layer is rendered electrically conductive with the aid of conductive silicon carbide.

3,721,849

DUAL PERSISTENCE SCREEN FOR A CATHODE RAY TUBE

Anthony V. Gallaro, Auburn, N.Y., assignor to GTE Sylvania Incorporated, Seneca Falls, N.Y.

Filed Jan. 7, 1971, Ser. No. 104,580
Int. Cl. H01j 29/18
U.S. Cl. 313—92 10 Claims



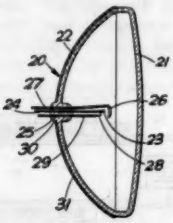
A plural-layer dual persistence screen is incorporated in a CRT having defined low and high velocity electron beams. A first layer of an optically excited long persistence phosphor is formed on a supporting surface. A second layer of electron responsive material is laid thereover to provide the aforementioned optical excitation. Each particle of the second layer is peripherally modified to effect a barrier therearound to limit excitation of the unmodified interior to energy of the high velocity beam. The second screen layer has a thickness to absorb the electron energy impinged thereon. A third layer of short persistence electron responsive phosphor is disposed over the second layer to be impinged and excited by the low velocity beam.

3,721,850

ELECTRIC LAMPS

William Leslie Giller, The Spinning, Gravelly Hill, Caterham, England

Filed Nov. 4, 1969, Ser. No. 873,982
Claims priority, application Great Britain, July 2, 1969, 33,378/69
Int. Cl. H01k 17/06, 17/10; F21v 11/16
U.S. Cl. 313—114 9 Claims



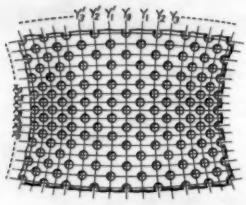
A lamp, particularly applicable as a vehicle headlamp, comprises a point source light at the focus of an ellipsoidal reflector. The beam is brought to a sharp focus outside the lamp at the second focus of the ellipsoid and a small screen, at or near this point will give a sharp cut-off to the beam or a sharply defined shadow. The ellipsoidal reflector is preferably formed by the envelope of a lamp having a tungsten ball as the light source.

3,721,851

COAXIAL FLASHLAMP

Harry L. Ceccon, 7 Bond Street, Boston, Mass., and Horace W. Furumoto, 14 Woodridge Road, Wellesley, Mass.

Filed Jan. 31, 1972, Ser. No. 222,241
Int. Cl. H01j 61/30
U.S. Cl. 313—201 7 Claims



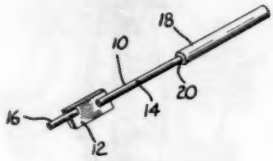
A coaxial flashlamp having a radially outward optical output comprising outer and inner hollow, transparent casings sealed to define an enclosed volume therebetween with an ionizable medium contained in that volume, a first electrode communicating with the medium at a first axial location and a second electrode communicating with the medium at a spaced apart second axial location and connected to an electrically conductive terminal member disposed within the inner casing and extending the axial length of the flashlamp.

3,721,852

REFRACTORY METAL PHOSPHATE AND PHOSPHIDE COATINGS FOR REFRACTORY METAL LEADS

Vincent Chiola; James S. Smith, and Clarence D. Vanderpool, all of Towanda, Pa., assignors to GTE Sylvania Incorporated, Seneca Falls, N.Y.

Division of Ser. No. 3,937, Jan. 19, 1970, Continuation-in-part of Ser. No. 647,106, June 19, 1967, abandoned. This application Jan. 12, 1972, Ser. No. 217,160
Int. Cl. H01j 5/46
U.S. Cl. 174—50.64 1 Claim



Lamps operating at high temperatures, and more particularly incandescent or arc lamps having sealed-in lead-in electrical conductors with improved service characteristics and longer service life are fabricated with a "coating" on the aforesaid leads comprising at least one of the following: a phosphate or phosphide of tungsten, or a phosphate or phosphide of molybdenum.

Illustrative of the results obtained upon service testing 400-W, 120-V quartz-iodine lamps, at operating temperatures of 500°–600°C., using

A. untreated, uncoated, molybdenum electrode assemblies,
B. platinum-clad, molybdenum electrode assemblies (exemplary of the prior-art techniques), and
C. tungsten phosphate-coated molybdenum electrode assemblies,

are as follows:

A. failed through oxidation and subsequent disintegration, with accompanying seal and lamp failure at 100 hours' operation,
B. failed at approximately 150 hours of life testing,
C. was still operating on a life test after 200 hours.

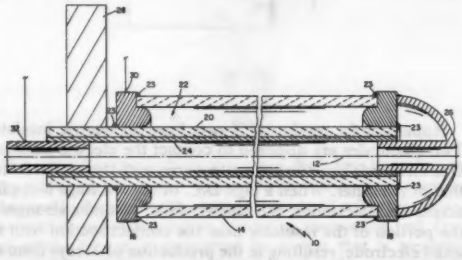
Processes for forming metal phosphides from metal phosphates and process for coating leads with refractory metal phosphates and phosphides are also disclosed.

3,721,853

SHADOW MASK HAVING APERTURES AT INTERSECTIONS OF BARREL-SHAPED AND PINCUSHION SHAPED LINES

Yohsuke Naruse, Kimitake Utsunomiya, and Yuzo Fuse, Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of abandoned application Ser. No. 877,183, Nov. 17, 1969. This application Dec. 1, 1971, Ser. No. 203,600
Int. Cl. H01j 29/06, 31/20
U.S. Cl. 313—85 S 4 Claims



In a color cathode ray tube having a curved phosphor screen, an apertures shadow mask and electron beam gen-

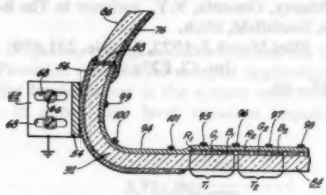
erating means for generating three in-line electron beams aligned in a horizontal direction, the apertures of the shadow mask are arranged in intersecting rows extending along barrel-shaped lines extending in the horizontal direction and along pin-cushion shaped lines extending in the vertical direction, an all of the rows are orthogonally related at each of the intersections thereof.

3,721,854

CATHODE-RAY TUBE AND SYSTEM TO ELIMINATE ELECTRICAL DISCHARGES DURING INDEXING

David E. Sunstein, 464 Conshohocken State Road, Bala-Cynwyd, Pa.

Filed Jan. 8, 1971, Ser. No. 105,047
Int. Cl. H01j 29/70
U.S. Cl. 315—21 C 14 Claims



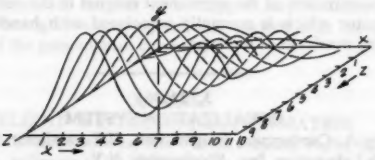
In a beam-index type of cathode-ray tube for presenting a color image, in which a cathode-ray beam of high energy scans across a beam index structure located adjacent an insulating portion of the tube envelope, as for example in an odd half-harmonic color television index tube, it has been found that brief bursts of interference occur occasionally in the tube during use, which apparently are due to brief discharges in the tube near the front face, and which can upset the operation of the index control operation. The invention overcomes this difficulty by providing an electrically conductive coating in smooth intimate continuous contact with the exterior of the insulating portion of the tube adjacent at least one edge of the scanned area of the tube. When one or more starting index stripes are utilized along one edge of the scanned area, the coating is placed on the exterior of the tube close to this edge. The coating is maintained at a substantially fixed potential, usually ground potential.

3,721,855

DISPLAY GENERATING MEANS CREATING ISOMETRIC PROJECTIONS OF A FAMILY OF CURVES

William Comley, Los Angeles, Calif., assignor to McDonnell Douglas Corporation, Santa Monica, Calif.

Filed Aug. 13, 1970, Ser. No. 63,361
Int. Cl. H01j 29/70
U.S. Cl. 315—22 13 Claims



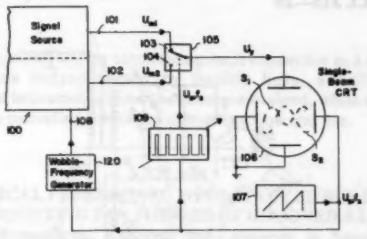
Means for extending the ability of an analog or hybrid computer which allow solution of problems, and various predetermined displays of the solutions as functions of additional independent variables of the operator's choice. The means include a staircase generator for varying an independent variable for each computation of the problem and peak and level sensing circuits so that a three-dimensional surface representing the solution to the problem may be displayed as a family of curves, as an isometric projection, as a cross-plot of a time history, as a cross-plot of positive or negative peaks, and as a conformal map.

3,721,856

SWITCHING SYSTEM FOR PLURAL PROJECTION OF TRACES ON SCREEN OF SINGLE-BEAM CATHODE-RAY TUBE

Rudolf Dick, Eningen, Germany, assignor to Wandel u. Goltermann, Reutlingen, Germany

Filed Dec. 14, 1970, Ser. No. 97,751
Claims priority, application Germany, Dec. 15, 1969, P 19 62 773.7
Int. Cl. H01j 29/70
U.S. Cl. 315—25 10 Claims



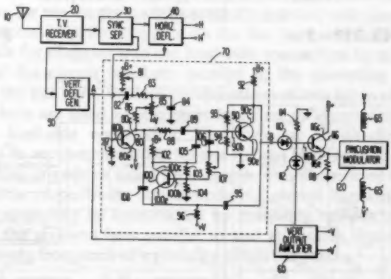
Two or more signals to be visually displayed on the screen of a single-beam cathode-ray tube are alternately fed to the vertical deflection electrodes of that tube for periods of different duration to generate traces distinguishable from one another by their brightness and/or the length of their strokes. In the first instance, they are interrupted for different fractions of a sweep cycle. In the second case, each trade is triggered on for a whole number of such cycles.

3,721,857

WAVEFORM GENERATING CIRCUIT

Peter Eduard Haferl, Adliswil, Switzerland, assignor to RCA Corporation

Filed Mar. 5, 1971, Ser. No. 121,401
Claims priority, application Great Britain, Mar. 11, 1970, 11,688/70
Int. Cl. H01j 29/70
U.S. Cl. 315—27 TD 14 Claims



Parabolic top and bottom pincushion correction signals are developed by applying a vertical sawtooth signal chopped at the horizontal deflection frequency to an amplifier. The resulting horizontal rate pulses are amplitude modulated by the vertical sawtooth signal and are converted into parabolic shaped signals in the amplifier by means of a feedback path from the output to the input of the amplifier which includes a double differentiat-

ing circuit. The output signals reverse polarity at the center of each vertical deflection interval as the polarity of the vertical deflection signal changes. These output signals can be applied to suitable pincushion modulation means for providing top and bottom pincushion correction for a wide angle television display.

3,721,858

SIZE AND HIGH VOLTAGE STABILIZING CIRCUIT

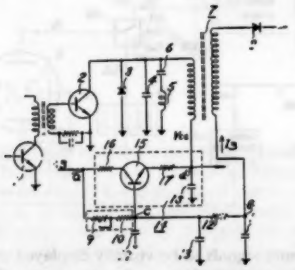
Kunio Shimizu, Osaka, Japan, assignor to Sanyo Electric Co., Ltd., Tokyo, Japan

Filed Aug. 19, 1970, Ser. No. 64,987

Claims priority, application Japan, Aug. 19, 1969, 44/65519; April 20, 1970, 45/34003; April 20, 1970, 45/34004; April 20, 1970, 45/34005; April 20, 1970, 45/34006

Int. Cl. H01j *29/70*

U.S. Cl. 315—29 **22 Claims**



A circuit for use in a color television receiver compensates for variations in the raster width resulting from the adjustment of the "Brightness" control and stabilizes the high voltage supply to reduce voltage variations. To this end, there is provided a control circuit for controlling the voltage to be applied to a horizontal output transistor and a detector means for detecting beam current. In alternative embodiments, there is also provided a shunt means for shunting a portion of the beam current.

3,721,859

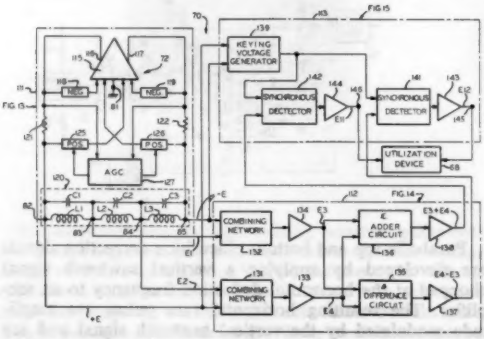
METAL OBJECT SENSOR, PARTICULARLY FOR RAILWAY WHEELS

Carl G. Blanyer, Thousand Oaks, Calif., assignor to Abex Corporation, New York, N.Y.

Filed Nov. 29, 1971, Ser. No. 202,755

Int. Cl. B61l *13/04, 11/08*

U.S. Cl. 317—5 **8 Claims**



A sensor for sensing movement of a metal object, such as a railway wheel, along a given path, comprising three sensing coils, all tuned to the same operating frequency, spaced along the path with their axes intersecting the path, and connected in series in three consecutive arms of a pentagon bridge. An oscillator, connected to the remaining two bridge arms, excites the coils at their operating frequency. A metal object moving along the path disturbs the fields of the coils in a sequence depending upon its direction of movement; the direction and velocity of the metal object are indicated in output signals derived by additively combining and synchronously detecting the signal voltages developed at the bridge terminals. In the preferred construction, the two end coils each include a few turns encompassing the central coil to reduce mutual coupling between adjacent coils.

3,721,860

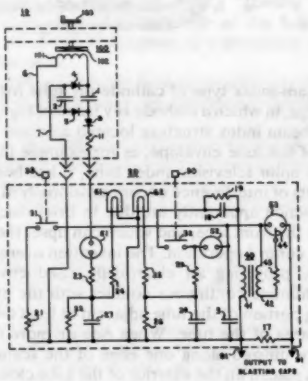
BLASTING MACHINE HAVING A MANUALLY OPERABLE PERMANENT MAGNET GENERATOR AND ANTI-DEMAGNETIZATION CIRCUIT

Earl M. Phinney, Oneonta, N.Y., assignor to The Bendix Corporation, Southfield, Mich.

Filed March 3, 1972, Ser. No. 231,699

Int. Cl. F23g *7/02*

U.S. Cl. 317—80 **21 Claims**



A manually operable blasting machine for firing an explosive bridge wire device or the like. A hand-cranked permanent magnet alternator is manually operated to generate an alternating current which is first rectified and then stored in a capacitor to be discharged when sufficient energy ix available to detonate an explosive bridge wire device or the like. The rectifying circuit is a unique voltage multiplier circuit that charges a plurality of capacitors in parallel on the positive half-cycle of the alternator and charges them in series on the negative half-cycle of the alternator. This novel arrangement of the capacitors in the rectifying circuit minimizes degmanetization of the permanent magnet in the rotor of the alternator which is normally associated with hand-cranked blasting machines of this type.

3,721,861

EQUALIZATION SYSTEM

Sidney A. Corderman, Binghamton, N.Y., assignor to McIntosh Laboratory, Inc., Binghamton, N.Y.

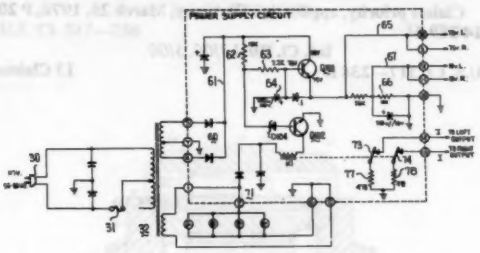
Filed June 8, 1971, Ser. No. 151,123

Int. Cl. H01h *47/18*

U.S. Cl. 317—16 **4 Claims**

A loudspeaker system which includes a loudspeaker and a drive, the loudspeaker being in an enclosure having a Q of 0.5 or less at a frequency well within the audio band, resulting in rapid rolloff from a frequency well above resonance to about 20 Hz, where cut-off is provided for. The drive has voltage

compensation for the rolloff of the speaker, and the latter is directly driven by an amplifier which it sees as a voltage source. Cascaded environmental equalizing circuits are provided, which provide 0, ± 2 and ± 4 db of mid-frequency (4KC) and of high frequency (20KC) equalization, additional



to the low frequency voltage equalization, and the latter is adjustable. Provision is made for delayed application of audio signal to the loudspeakers in the system until voltages have stabilized, to avoid high level transient impulses to the speaker.

3,721,862

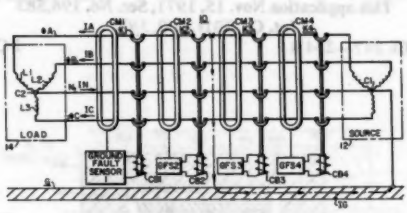
ELECTRICAL APPARATUS INCLUDING A GROUND FAULT SENSOR

Michael B. Brennen, Pittsburgh, Pa., and Guido Watson, Marlowes, Hemel Hempstead, Herts, England, assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 30, 1971, Ser. No. 175,880

Int. Cl. H01h *47/18*

U.S. Cl. 317—18 D **5 Claims**



A ground fault detecting system including a current monitor, a ground fault sensor and a circuit breaker. The ground fault sensor responds to the presence of ground fault current to actuate a circuit breaker to open the circuit in which the ground fault current is flowing. The ground fault sensor includes circuit elements which perform corresponding circuit functions such as time delay and reset. The ground fault sensor is adapted to provide an adjustable or variable time delay so that the circuit breaker to be tripped may be delayed in tripping through a wide range of time periods after the initial sensing of the ground fault current.

3,721,863

SELECTIVE INTERCONNECTION MATRIX

Pierre Hardouin, Asnieres, and Michel Nicolas, Paris, both of France, assignors to La Telemecanique Electrique, Nanterre, Hauts de Seine, France

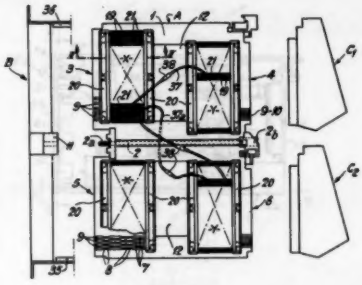
Filed June 22, 1971, Ser. No. 155,519

Claims priority, application France, June 22, 1970, 7022915

Int. Cl. H02b *1/02*

U.S. Cl. 317—101 CE **12 Claims**

A selective interconnections matrix is provided of reduced dimension compared with existing known arrangements, and enabling sufficient interconnections to be made for practical application. It has been observed that a normal 100 matrix is usually employed for only 500 or so connections out of the



10,000 possible, and by terminating each connector in a series of contacts interconnected by flexible links, a sufficient number of interconnections has been maintained, while at the same time providing simplicity of construction and use.

3,721,864

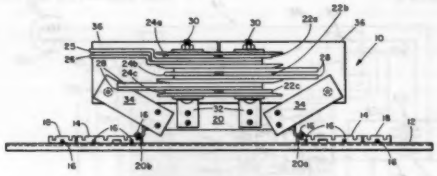
ELECTRICAL PANELBOARD WITH STACKED BUS BARS AND MOUNTING PAN FORMED OF GROOVED BARS

Gustave Rozenboom, Kokomo, Ind., assignor to Square D Company, Park Ridge, Ill.

Filed May 20, 1971, Ser. No. 145,269

Int. Cl. H02b *1/02*

U.S. Cl. 317—119 **10 Claims**



An electrical panelboard having stacked elongated, flatwise aligned, flat bus bars and plug-in load-side connectors is provided with a mounting pan formed of flat, edgewise aligned extruded aluminum bars extending parallel to the bus bars in spaced relationship thereto edgewise thereof. Electric circuit breakers for use on the panelboard are provided with plug-on line terminal jaws for plugging on the bus bars and stab load terminals for plugging into the load-side connectors by movement of the circuit breakers parallel to the mounting pan toward the bus bars. Various combinations of two types of extruded bars are used to accommodate four different sizes of plug-in load-side connectors. The bars are longitudinally grooved to receive mounting screws for the plug-in load-side connectors anywhere along their length. Panelboards of various widths respectively accommodating circuit breakers of various sizes may be constructed by mounting various numbers of the grooved bars parallel to and at various distances respectively from each of a plurality of bus bar stacks.

3,721,865

PLASTIC CASE POWER SUPPLY

Leo C. Rademaker, and Ezra C. Hill, both of Fort Wayne, Ind., assignors to General Electric Company, Fort Wayne, Ind.

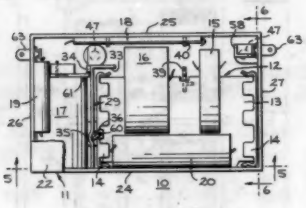
Filed Oct. 29, 1971, Ser. No. 193,935

Int. Cl. H02b *1/18*; H01f *27/02*

U.S. Cl. 317—120 **10 Claims**

A power supply includes a preformed case of electrically non-conductive material. Mounting bosses are integrally

formed in the case to provide mounts for the power supply and mounting surfaces for active components of the power supply.



Integral internal partitions and brackets mount various active components of the power in proper relationship in the case and provide electrical insulation where desired.

3,721,866

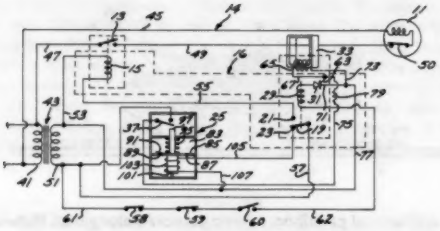
ELECTRICAL TIME LOCK-OUT SYSTEM

Harold A. McIntosh, South Pasadena, Calif., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Aug. 23, 1971, Ser. No. 173,905

Int. Cl. H01h *47/18*; G05d *23/32*

U.S. Cl. 317—141 R **14 Claims**



A time lock-out system including an operator circuit having a normally open lock-out switch therein. A control circuit is provided which includes a holding switch that is responsive to the absence of an electrical signal to assume a first position and responsive to the presence of such electrical signal to assume a second position. Current sensing means is provided for sensing current in the operating circuit and is responsive to the current sensed to produce a triggering signal to hold the holding switch to its second position. A time delay device is connected with the holding switch and is responsive to an electrical signal in the control circuit to, after a selected time delay, produce a triggering signal to switch the holding switch to its second position. The control circuit connects the holding switch with the lock-out switch and time delay device to complete a circuit to the lock-out switch when the holding switch is in its second position to thereby close such lock-out switch and to, further, complete a circuit to the time delay device when the holding switch is in the first position whereby the lock-out switch will be closed as long as both the control and operator circuits are energized but will be opened any time current is discontinued in either the operator or control circuit and will remain open until the timed delay device is re-energized for the pre-determined timed delay.

3,721,867

TABLET-SHAPED SEMICONDUCTOR COMPONENT AND PROCESS FOR ITS MANUFACTURE

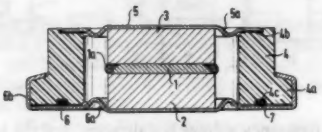
Winfried Schierz, Roth, Germany, assignor to SEMIKRON Gesellschaft fur Gleichrichterbau und Elektronik m.b.H., Nurnberg, Germany

Filed March 25, 1971, Ser. No. 128,102

Claims priority, application Germany, March 25, 1970, P 20 14 289.6

Int. Cl. H01l *3/00, 5/00*

U.S. Cl. 317—234 R **13 Claims**



A semiconductor wafer is completely encapsulated between two metal parts contacting its opposite faces and serving as circuit contact areas. Peripherally surrounding the wafer is an insulating member to which the metal parts are sealed.

3,721,868

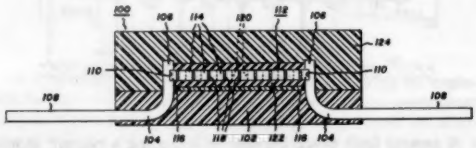
SEMICONDUCTOR DEVICE WITH NOVEL LEAD ATTACHMENTS

Edwin S. Smith, Jr., Camillus, N.Y., assignor to General Electric Company, Syracuse, N.Y.

Continuation of Ser. No. 863,208, Oct. 2, 1969, abandoned. This application Nov. 15, 1971, Ser. No. 198,583

Int. Cl. H01l *3/00, 5/00*

U.S. Cl. 317—234 R **1 Claim**



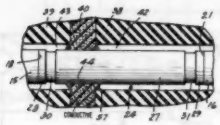
A header is associated with two leads mediate their ends to form upstanding pin portions. A semiconductive sub-assembly comprised of a stack of junction containing semiconductive elements together with end-most junction-less semiconductive attachment elements are bonded to the pin portions in spaced relation with the header. The semiconductive sub-assembly may be fitted into depressions in the pin portions and a bonding material used to further improve the ohmic connection therebetween. A metal filled settable plastic may be employed for this purpose. The bonding material has an application and setting temperature below the softening temperature of bonding material used to form ohmic interconnections between the elements of the semiconductive sub-assembly. A passivant and a plastic casement surround the semiconductive sub-assembly. In an alternate form, the leads and attachment elements of the semiconductive sub-assembly are associated with an insulative substrate while the junction containing semiconductive elements remain free of contact with the substrate.

3,721,869

FILTER CONTACT CONNECTOR ASSEMBLY WITH CONTACT PINS HAVING INTEGRALLY CONSTRUCTED CAPACITORS

Alfred Paoli, Chicago, Ill., assignor to Harvey Hubbell Incorporated, Chicago, Ill.

Filed Nov. 22, 1971, Ser. No. 200,946
Int. Cl. H01g 1/00
U.S. Cl. 317—256 14 Claims



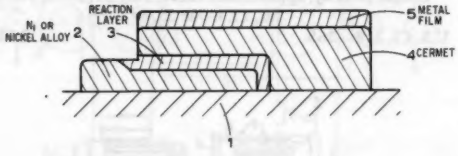
An electrical connector includes resiliently mounted contact pins having integrally constructed capacitors for shunting interference signals to ground by way of an electrically conductive resilient mounting member and the outer shell of the connector.

3,721,870

CAPACITOR

James Edge, Morpeth, England, assignor to Welwyn Electric Limited, Bedlington, Northumberland, England

Continuation-in-part of Ser. No. 47,767, June 19, 1970, abandoned. This application June 25, 1971, Ser. No. 156,700
Int. Cl. H01g 1/01
U.S. Cl. 317—258 9 Claims



The manufacture is described of capacitors having a very high capacitance value which is achieved by a very thin dielectric layer, said capacitors being constituted by (i) a layer of nickel or a nickel alloy, (ii) a layer of a cermet adapted to become electrically conductive and containing glass having a melting point less than that of layer (i), and (iii) a layer of a dielectric, said layer (iii) having been formed by chemical interaction of layer (i) with layer (ii) on firing to a temperature at which said interaction takes place, for a time sufficient to produce said layer (iii), the glass content of the cermet being at least 3 percent by weight but insufficient for the cermet itself to act as a dielectric.

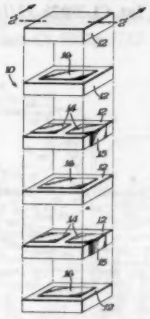
3,721,871

HIGH VOLTAGE MONOLITHIC CERAMIC CAPACITOR

John B. Heron, 1518 Celia, Wichita Falls, Tex.

Filed Aug. 12, 1969, Ser. No. 849,474
Int. Cl. H01g 1/00
U.S. Cl. 317—261 2 Claims

The possibility of shorting through potential failure paths at high voltage in a monolithic ceramic capacitor is reduced by inclusion of floating electrodes alternately spaced between sets of capacitor plates which are deposited on the same surface of ceramic layers in a ceramic stack.

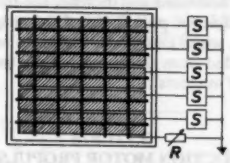


3,721,872

PROCESS AND APPARATUS FOR PRODUCING ELECTRIC FIELDS IN CLOSED ROOMS AND FOR INTENSIFYING FIELD EFFECTS WITHIN CONFINED SPACES

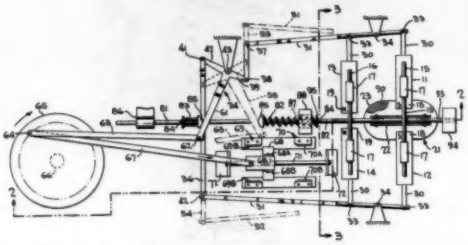
Ewald Adolf Sorg, Roggenstrasse 33, and Udo Gerhard Sommer, Schlosserstrasse 36, both of Stuttgart, Germany

Filed July 24, 1969, Ser. No. 844,411
Int. Cl. H02g 3/26
U.S. Cl. 317—262 AE 5 Claims



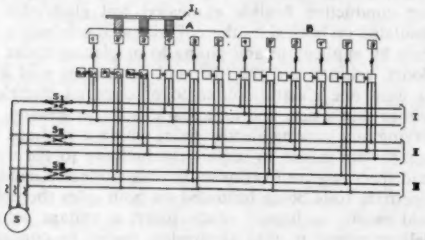
A process for producing, intensifying and varying electric fields within a confined space, comprising the steps of surrounding said space with conductive materials, such as metal, steel-reinforced concrete and other building materials incorporating electrically-conductive substances and being exposed to the effects of the weather, connecting conductive flexible elongated foil electrodes being insulated on both sides thereof with said conductive materials by application and gluing to or placing under walls, floors, ceilings and the like, and connecting said foils to at least one electric source to produce an electric field within said space, and an apparatus for producing, intensifying and varying electric fields within a confined space, comprising means to impart conductivity to the walls of said space; means to connect flexible elongated conductive electrode foils being insulated on both sides thereof with said means to impart conductivity; a voltage source to deliver power to said electrodes; means to connect the power delivery to said source; wherein said electrode being placed under the floor covering is so provided that the insulating covering layer of said electrode serves simultaneously as protective layer against mechanical damages, and that said floor covering adheres thereto in a manner such as to prevent slipping.

3,721,873
RECIPROCATING MOTOR
George R. Vogel, 221-22 Hempstead Avenue, Queens Village, N.Y.
Filed March 14, 1972, Ser. No. 234,493
Int. Cl. H02k 33/18
U.S. Cl. 318—128 11 Claims



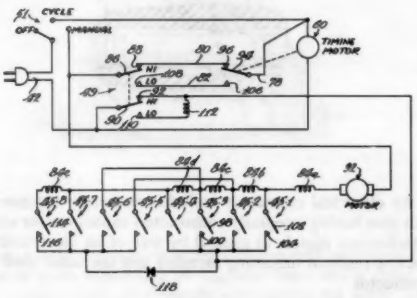
An electric motive device includes two pairs of magnets, movable in pairs relative to each other. The magnets of each pair have pole faces positioned normally to cause the magnets of the respective pair to repel each other. The pole faces of each magnet are spaced to form an air gap through which magnetic flux flows between the pole faces of each magnet. A shuttle moves relative to the pairs of magnets into and out of the air gaps. The shuttle includes a magnetic core and a coil which is driven by a current source to enable the core to be saturated. The shuttle and magnets are interconnected with each other and a commutator by a lever arm system and a snap action device so that current is supplied only intermittently to the coil. When no current is supplied to the coil, the core provides a low reluctance path for fluxes of the magnets to enable the magnets to be drawn towards the shuttle. In response to movement of the magnets into close proximity with the shuttle, current is supplied to the coil, causing the core to become saturated and increase the reluctance thereof. Thereby, the adjacent pole faces of the magnets repel each other. The coil, when energized, functions as an electromagnet that is repelled from the air gap of one pair of magnets to the other pair of magnets.

3,721,874
LINEAR INDUCTION MOTOR PROPULSION SYSTEM
Yves Pelenc, 38 La Tronche, and Jacques Gatellet, 38 Grenoble, both of France, assignors to Merlin Gerin, 38 Grenoble, France
Filed Jan. 12, 1972, Ser. No. 217,198
Int. Cl. H02p 7/36
U.S. Cl. 318—135 13 Claims



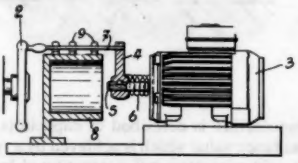
A linear induction motor propulsion device for propelling in synchronism a plurality of armatures along a plurality of polyphase energizable stator members. The phase sequence of the supply voltage of the different stator members is periodically inverted according to a predetermined program in such a manner that the thrust characteristic wave form has attenuated leading and trailing edges.

3,721,875
DUAL CYCLE BLENDER CONTROL MEANS
John Edward Feldner, and William Joseph Collins, both of Milwaukee, Wis., assignors to Oster Corporation, Milwaukee, Wis.
Filed Oct. 6, 1971, Ser. No. 186,989
Int. Cl. H02p 7/00
U.S. Cl. 318—245 10 Claims



A control means for a blender comprises a cam driven by a timing motor that has a plurality of camming surfaces which control the energization of the blender motor in an intermittent manner. The ON and OFF cycle times of the intermittently operated blender are automatically changed to correspond to the operating speed range of the blender.

3,721,876
ELECTROMAGNETIC SELECTOR
Pierre Guidet, 74, rue Robert, 69 Lyon, France
Filed July 30, 1971, Ser. No. 167,767
Claims priority, application France, July 31, 1970, 7029128
Int. Cl. G04c 23/44
U.S. Cl. 318—265 3 Claims

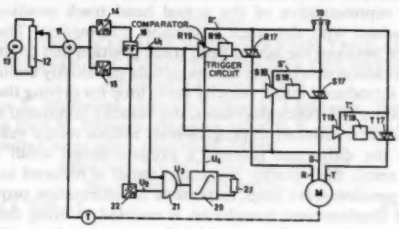


An electromagnetic selector comprising a series of retractable stops which may be operated by an electromagnet energized by an electric current controlled by a magnetic contact through which the current is fed through an interrupter connected directly to a source of electric current.

3,721,877
TEXTILE YARN WINDING MACHINE WITH ANTI-PATTERNING DEVICE
Herman Werffeli, Horgen, Switzerland, assignor to Maschinenfabrik Schweiter A.G., Horgen, Switzerland
Filed Apr. 19, 1972, Ser. No. 245,458
Claims priority, application Switzerland, Apr. 23, 1971, 5,977/71
Int. Cl. H02p 5/16
U.S. Cl. 318—318 9 Claims

To prevent undesirable patterning on the cone and to provide for slip between the yarn package and the grooved

traverse drum therefor, the speed of the grooved drum is varied by intermittently interrupting the drive to the drum under control of an electrical switch which periodically



interrupts the power supply to the motor, the phasing of interruption with respect to the phase of supply current being controlled in dependence on the load of the motor.

3,721,878

WINDSHIELD WIPER ARRANGEMENT

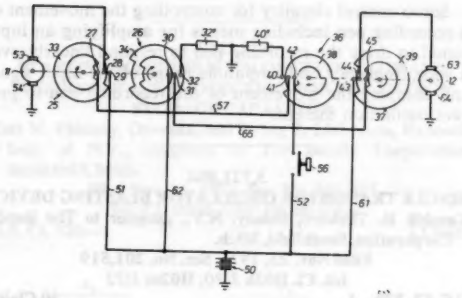
Paul Gumbert, Buhlertal, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed June 15, 1972, Ser. No. 262,975

Claims priority, application Germany, June 26, 1971, P 21 31 900.6

Int. Cl. B60s 1/08

U.S. Cl. 318—443 **5 Claims**



A first and second wiper are each pivotable between a starting position and a direction-reversing position. A first and a second motor each drive the respective wipers and are connected with one pole of the source of electrical energy. A first and second circuit connect said first motor with the other pole of said source, and a third and normally open fourth circuit connect said second motor with the other pole of said source. A first control switch assembly is interposed in said first and third circuit and is responsive to displacement of said first wiper to make and break said first and third circuit while the said first wiper is in and out of its starting position. An operator-controlled switch is interposed in said second circuit to make and break the latter at the will of an operator. A second control switch assembly is interposed in said fourth circuit and controlled by said first wiper so as to make said fourth circuit while said first wiper is in its direction-reversing position thereof.

3,721,879

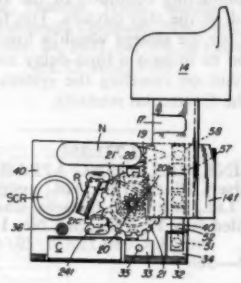
POWER CONTROL FOR PORTABLE ELECTRIC TOOL

Lawrence G. Corey, Rockville, and John J. Opalenik, New Britain, both of Conn., assignors to Arrow-Hart, Inc., Hartford, Conn.

Filed July 2, 1965, Ser. No. 469,218

Int. Cl. H02p 5/12

U.S. Cl. 318—345 **12 Claims**



A trigger operated switch unit for incorporation within the housing of a portable electric motor powered tool has power control and by-pass switches and a rotary potentiometer all controlled and operated by movement of the trigger through cams and through a rack-and-pinion connection between the trigger and the shaft of the potentiometer, to control the speed of the motor via solid state elements and circuitry. The unit has two parallel plates one of which is metal and acts as a heat sink.

3,721,880

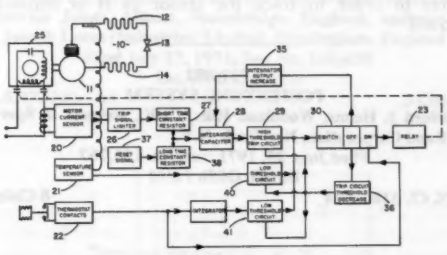
REFRIGERANT COMPRESSOR MOTOR CONTROL

Donald E. Neill, Liverpool, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Oct. 12, 1971, Ser. No. 188,286

Int. Cl. H02h 7/08

U.S. Cl. 318—471 **7 Claims**



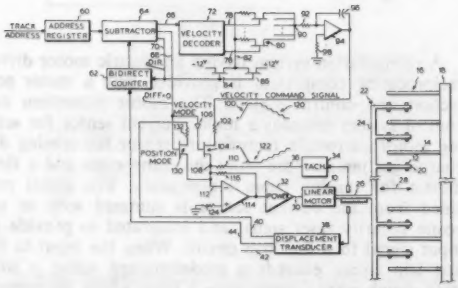
A refrigeration system having an electric motor driven reciprocating compressor is provided with a motor protection and control system. The motor protection and control system includes a motor current sensor for sensing motor current, a temperature sensor for sensing discharge gas temperature from the compressor and a thermostat for sensing room temperature. The signal provided from the current sensor is summed with an opposite polarity reset signal and integrated to provide an input signal to a first trip circuit. When the input to the first trip circuit exceeds a predetermined value, a solid state switch means deenergizes a relay which disconnects the motor from the line current source. The temperature sensor is connected to a second trip circuit which is also capable of de-energizing the relay and the motor in the event of an excessive temperature condition. The ther-

mostat is connected to a third trip circuit in a manner such that opening of the thermostat contacts de-energizes the solid state switch and relay. Closing the thermostat contacts passes a signal through the solid state switch means to energize the relay provided the switch has been reset to the conducting condition. Feedback means are provided responsive to the non-conducting condition of the switch to raise the output of the integration circuit and additional feedback means are provided responsive to the nonconducting condition of the switch to decrease the threshold of the trip circuits. The feedbacks provide a reset level for the system which is lower than the initial trip level and to impose a time delay associated with the first trip circuit on resetting the system after a trip due to opening the thermostat contacts.

3,721,881
LINE FOLLOWING APPARATUS
Jack W. Critser, Miachelville, Md., assignor to Instronics Ltd., Stittsville, Ontario, Canada
Filed July 22, 1971, Ser. No. 165,291
Int. Cl. G05b *19/36, 19/42*
U.S. Cl. 318—568 **11 Claims**

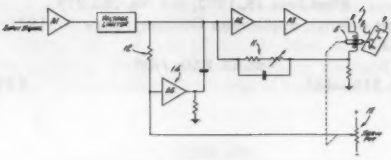
Apparatus for providing the X and Y coordinates of selected points on a line as it is traced on a board by a manually movable sensor including an X coordinate radiation source comprising a first stretched wire running beneath the board parallel to the Y axis and a Y coordinate radiation source comprising a second stretched wire running beneath the board parallel to the X axis. Signals derived from the sensor are applied to X and Y servo motors for individually moving the first and second wires in order to track the sensor as it is manually moved.

3,721,882
POSITIONING SYSTEM
Clifford J. Helms, Woodland Hills, Calif., assignor to Sperry Rand Corporation, New York, N.Y.
Filed June 25, 1971, Ser. No. 156,767
Int. Cl. G05b *11/18*
U.S. Cl. 318—594 **8 Claims**



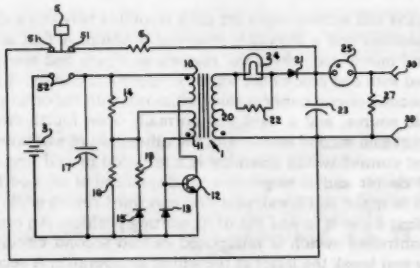
A system useful in a magnetic disc storage unit for rapidly and accurately positioning a magnetic head over a selected disc track. The system includes a linear motor for driving a carriage structure supporting a head carrying arm assembly. The motor is selectively energized by a control unit in response to new track command information provided thereto. The control unit includes a velocity transducer for yielding carriage velocity information and a displacement transducer for yielding track count information. A counter, responsive to said track count information, at all times stores a count representative of the actual head track position for comparison with the track command information. The difference between the actual head track position and command track position determines the magnitude of velocity command signal introduced into a velocity servo loop for driving the motor. As the difference decreases, the velocity command signal magnitude is reduced to progressively reduce motor velocity. When the difference reaches a predetermined small value (e.g., zero), the velocity command signal is reduced to zero and a position servo loop, responsive to information provided by the displacement transducer, is enabled to bring the carriage to rest in a position at which the error signal provided by the displacement transducer to the position servo loop is nulled.

3,721,883
SERVO CONTROL CIRCUIT
Chatland Whitmore, Ossining, and Gerald A. Richardson, Croton-on-Hudson, N.Y., assignors to Cambridge Instrument Company, Inc., Ossining, N.Y.
Filed June 30, 1971, Ser. No. 158,213
Int. Cl. G05b *5/01*
U.S. Cl. 318—615 **11 Claims**



Servo control circuitry for controlling the movement of a recording pen including means for amplifying an input signal to drive the recording pen to respond linearly over a wide frequency and amplitude range of the input signal and damping the movement of the recording pen to prevent oscillation thereof.

3,721,884
SINGLE TRANSISTOR OSCILLATOR BLASTING DEVICE
Kaushik H. Thakore, Sidney, N.Y., assignor to The Bendix Corporation, Southfield, Mich.
Filed Nov. 23, 1971, Ser. No. 201,519
Int. Cl. H03k *3/30;* **H02m** *3/22*
U.S. Cl. 320—1 **30 Claims**



A blasting apparatus for firing an explosive bridge wire device or the like comprising a d.c. to d.c. converter circuit that utilizes only one transistor in the oscillator portion of the

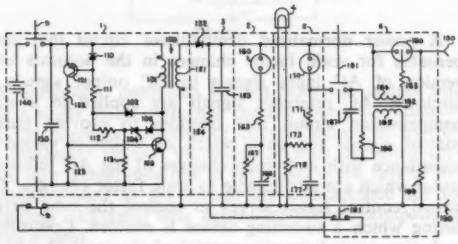
circuit to transfer energy from a battery to a storage capacitor which is automatically discharged upon reaching a predetermined energy level. The circuit also includes a single switch which in the OFF position discharges the storage capacitor and in the ON position connects the battery to the primary winding of the transformer to charge the storage capacitor.

3,721,885

BLASTING MACHINE WITH OVERVOLTAGE AND UNDERVOLTAGE PROTECTION FOR THE ENERGY STORAGE CAPACITOR

James E. McKeown, Sidney; Irving E. Linkroum, Hancock, and Earl M. Phinney, Oneonta, all of N.Y., assignors to The Bendix Corporation, Southfield, Mich.

Filed Nov. 23, 1971, Ser. No. 201,525
Int. Cl. H03k 3/30; H02m 3/22
U.S. Cl. 320—1 **8 Claims**



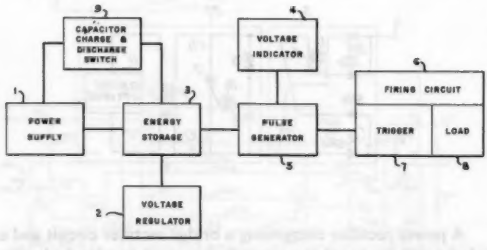
An electrical system for firing an explosive bridge wire device or the like which includes a battery powered blocking oscillator to charge a storage capacitor, a circuit controlling the maximum energy to be contained in the storage capacitor, and a circuit that determines the minimum energy in the storage capacitor before the storage capacitor can be discharged into one or more explosive bridge wire devices or the like.

3,721,886

BLASTING MACHINE WITH OVERVOLTAGE AND UNDERVOLTAGE PROTECTION FOR THE ENERGY STORAGE CAPACITOR

Earl M. Phinney, Oneonta, and Irving E. Linkroum, Hancock, both of N.Y., assignors to The Bendix Corporation, Southfield, Mich.

Filed Nov. 23, 1971, Ser. No. 201,527
Int. Cl. H03k 3/30; H02m 3/22
U.S. Cl. 320—1 **2 Claims**



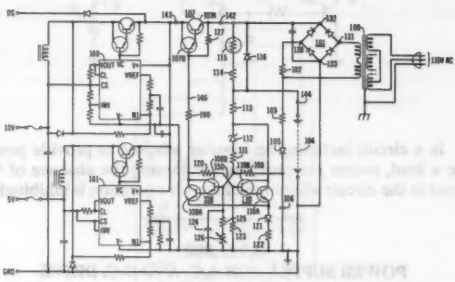
A blasting machine for firing an explosive bridge wire device or the like. The blasting machine includes a storage capacitor that is charged to an energy level within a predetermined range. The upper limit of the energy range is controlled by a two-electrode spark discharge device which operates as an upper voltage control and the lower limit of the energy range is controlled by a two-electrode spark device which does not permit the capacitor to be discharged until the second device is conducting, which occurs at the desired lower voltage level whereby the energy discharged from the storage capacitor must be within the energy levels established by the two spark discharge devices.

3,721,887

BATTERY PROTECTION CIRCUIT

Charles Nickerson, Poulsbo, Wash., assignor to American Telephone and Telegraph Company, New York, N.Y.

Filed Nov. 24, 1971, Ser. No. 201,656
Int. Cl. H02j 9/00
U.S. Cl. 320—13 **2 Claims**



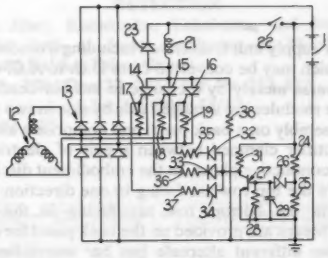
A protection circuit for an AC powered unregulated power supply having a rechargeable battery means comprising nickel-cadmium cells comprises a two-state circuit which is energized by the presence of AC power supplied to the unregulated power supply. The protection circuit is arranged to disconnect the load from the power supply in the event that AC power fails and the terminal voltage of the battery means falls below a predetermined minimum value. Furthermore, the load will not be picked up until AC power is restored.

3,721,888

BATTERY CHARGING SYSTEMS FOR ROAD VEHICLES

Maurice James Allport, Stourbridge, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed July 27, 1971, Ser. No. 166,439
Int. Cl. H02p 9/30
U.S. Cl. 320—64 **3 Claims**

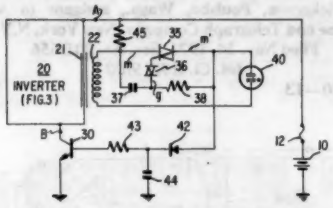


A battery charging system for a road vehicle has a three-phase wound field alternator for charging the vehicle battery. There are three thyristors with their cathodes connected to the phase points of the alternator and their anodes connected to the positive battery terminals through the field winding of the alternator, an means sensitive to the battery voltage for providing gate current to the thyristors only when the battery voltage is below a predetermined value.

3,721,889
LOAD SENSING CIRCUITS

Jack Charles Sondermeyer, Somerville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed June 30, 1971, Ser. No. 158,452
Int. Cl. H02m 7/00; H02j 7/00; H05b 37/02
U.S. Cl. 321—8 R 4 Claims

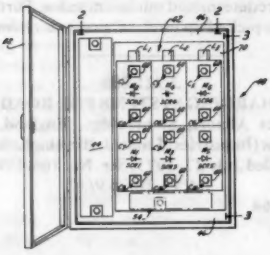


In a circuit including an inverter adapted to provide power to a load, means are provided for sensing the absence of the load in the circuit whereupon inverter operation is inhibited.

3,721,890
POWER SUPPLY FOR A.C. AND D.C. DRIVE

James P. Ettinger, and Christian S. Otteson, both of Ridgefield, Conn., assignors to Electric Regulator Corporation, Norwalk, Conn.

Filed March 27, 1972, Ser. No. 238,082
Int. Cl. H02m ; H02b
U.S. Cl. 321—8 R 17 Claims



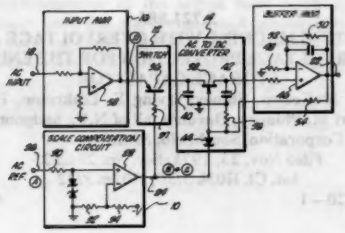
A power supply unit is disclosed including a modular power section which may be converted from D.C. to A.C. operation and vice versa merely by a change in bus bar configuration. The power modules are arranged side by side in two rows on a bus bar assembly on a back panel and comprise a silicon controlled rectifier clamped between a pair of electrically and thermally conductive plates. In the embodiment disclosed, the rectifiers in the top row are facing in one direction while the rectifiers in the bottom row are facing in the opposite direction. Means are provided on the back panel for mounting at least two different alternate bus bar assemblies, one of which is designed to connect the rectifiers in a first operative circuit arrangement for D.C. operation and the other of which is designed to connect the rectifiers in a second operative circuit arrangement for A.C. operation.

The modules are provided with a front panel having spaced apertures for access to the quick detachable captive nut assembles used to mount the clamping plates on the bus bars. Those apertures also serve as a convenient gripping means for handling individual modules for repair or replacement.

3,721,891
POWER NORMALIZED DEMODULATOR

Adrian J. Moses, Newhall, Calif., assignor to Lear Siegler, Inc., Santa Monica, Calif.

Filed Apr. 13, 1972, Ser. No. 243,689
Int. Cl. H02m 7/20
U.S. Cl. 321—47 13 Claims

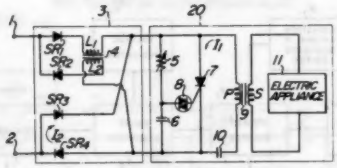


A power normalized demodulator circuit that compensates for scale factor changes in the accurate conversion of AC input signals to DC output signals, is disclosed. AC reference signals are applied to a scale compensation circuit that operates to provide pulsed control signals the pulse width of which is varied in accordance with amplitude changes of the AC reference signal which are attributable to scale factor changes. The pulsed control signal serves to control the time period during which a switching device is enabled. Controlling such time period permits control of the level of voltage applied as an input to an AC to DC converter circuit. The pulsed control signal also serves to control operation of the AC to DC converter circuit which includes another switching device that is cyclically rendered conductive by the pulsed control signal to permit the discharge of an input capacitor through the converter switching device to charge an output capacitor. The voltage to which the output capacitor is charged essentially constitutes the desired DC output signal. However, a buffer amplifier stage is employed to provide a high impedance for the converter and the provide a nominal gain.

3,721,892
POWER RECTIFIER INCLUDING A BRIDGE RECTIFIER CIRCUIT

Masayuki Ohyama, and Takefumi Nakamizo, both of Toyonaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jan. 12, 1972, Ser. No. 217,197
Int. Cl. H02m 7/06
U.S. Cl. 321—47 7 Claims

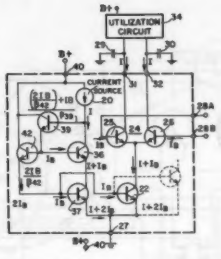


A power rectifier comprising a bridge rectifier circuit and a choke coil for supplying a rectified current to a load wherein said choke coil is divided into two portions respectively inserted in two arms of the bridge circuit to be connected to one terminal of an AC power source, and rectifier means inserted in the other two arms to be connected to the other terminal of the AC power source are utilized not only to flow the rectified current to the load, but also to discharge an energy stored in the load depending on its impedance.

3,721,893
STABLE CURRENT REFERENCE CIRCUIT WITH BETA COMPENSATION

William F. Davis, Tempe, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.

Filed May 30, 1972, Ser. No. 257,695
Int. Cl. G05f 1/58; H03k 1/12
U.S. Cl. 323—4 10 Claims

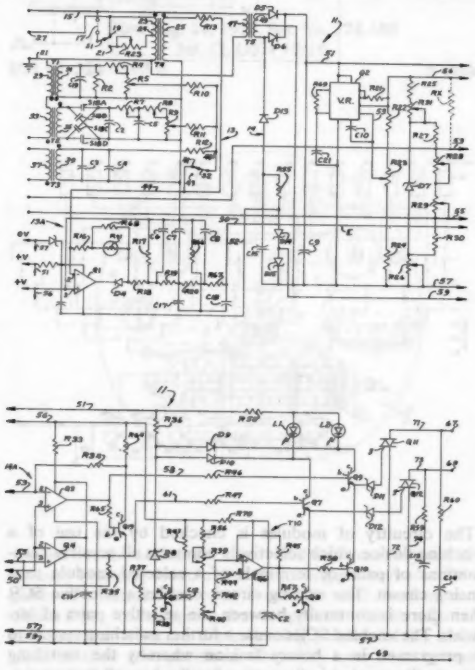


A monolithic integrated current reference system utilizes a single stable reference current source for controlling the operation currents of circuits formed as part of the integrated circuit. Variations of such operating currents with temperature due to variations in the beta of the transistors used in the system are compensated for by providing additional beta dependent current components to the system.

3,721,894
REGULATOR CONTROL

Robert W. Beckwith, 1002 Greenfield Lane, Mount Prospect, Ill.

Filed May 15, 1972, Ser. No. 253,425
Int. Cl. G05f 5/00; H01f 29/00
U.S. Cl. 323—20 35 Claims

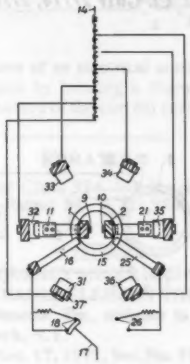


A circuit is disclosed for providing control to a voltage regulator device for monitoring and regulating the voltage of an electrical system. The line voltage, a voltage in phase with the input current and a voltage phase shifted relative to the input current are summed and the resultant D.C. voltage is compared with a voltage bandwidth circuit.

3,721,895
CARRIER MEMBER FOR STEP SELECTORS IN TAP CHANGERS

Sivert Norman and Erik Hammar, Ludvika, Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed June 9, 1972, Ser. No. 261,239
Claims priority, application Sweden, June 21, 1971, 8,013/71
Int. Cl. H02p 13/06; H01h 19/58
U.S. Cl. 323—43.5 R 2 Claims

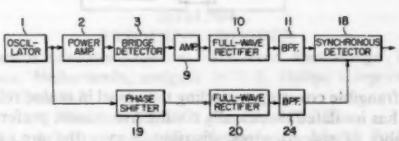


A tap changer for transformers has step selectors and load connectors. The step selector has a center part provided with carrier members for movable connection contacts and slip rings for brushes. The carrier members are formed of two parallel rods of insulating material, both mounted to turn around the axis of the center part. Each rod carries a number of movable connecting contacts and a corresponding number of slip rings. The two rods are positioned inside the slip rings so that they can be pivoted stepwise in relation to each other through substantial angles.

3,721,896
IMPROVED PHASE SENSITIVE EDDY CURRENT DEFECT DETECTOR UTILIZING FREQUENCY DOUBLING OF DETECTED SIGNAL PRIOR TO PHASE DETECTION

Toshihiro Mori, Kohoku-ku, Yokohama, and Seigo Ando, Kawaski, both of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 23, 1971, Ser. No. 211,222
Int. Cl. G01r 33/12
U.S. Cl. 324—37 6 Claims



In an eddy current defect detector of the type wherein a bridge detector energized by an oscillator is used to convert the impedance variation of a detecting coil into an electrical signal in accordance with a defect of an object being examined, there is provided a frequency doubler for doubling

the frequency of the output from the bridge detector, means to shift the phase of the output of the oscillator by a predetermined angle and double the frequency thereby producing a reference phase signal, and means for sychronously rectifying the output from the frequency doubler by using the reference phase signal.

3,721,897

WALL THICKNESS AND TEMPERATURE MONITORING APPARATUS FOR BOILER TUBES

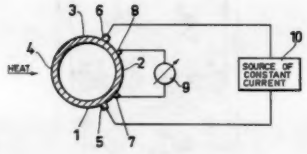
Gustaf Emanuel Edling, Stockholm, Sweden, assignor to Apparatkemiska AB AKA, Stockholm, Sweden

Continuation of abandoned application Ser. No. 806,129, Mar. 11, 1969. This application May 7, 1971, Ser. No. 141,409

Claims priority, application Sweden, Mar. 14, 1968, 3,352/68

Int. Cl. G01r *27/14, 27/02*

U.S. Cl. 324—64 **2 Claims**



Continuous or intermittent examination of operating conditions and operational safety of the boiler tubes of a boiler, during operation of the boiler, is effected by providing an electric current through the wall material of a boiler tube and measuring the voltage drop between points on the boiler tube.

3,721,898

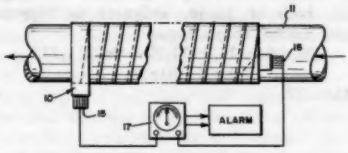
APPARATUS FOR DETECTING LEAKAGE FROM OR RUPTURE OF PIPES AND OTHER VESSELS CONTAINING FLUID UNDER PRESSURE

Paul Dragoumis, 15 Karen Way, Summit, N.J., and Arthur Stirling Grimes, 148 Wicks Road, Commack, N.Y.

Filed Dec. 4, 1968, Ser. No. 781,171

Int. Cl. G01r *27/02;* **G01m** *3/08*

U.S. Cl. 324—65 R **6 Claims**



A frangible covering encircling the vessel in sealed relationship has insulated electrically conductive means, preferably a plurality of spaced wires, distributed over the area of the covering. A leak causes the fluid under pressure to rupture the covering, thereby increasing the resistance of the conductive means. A meter detects the change in resistance, and may set off an alarm. Tape containing insulated fine wires may be wound around the vessel with successive turns sealed together, and preferably adhered to the vessel.

3,721,899

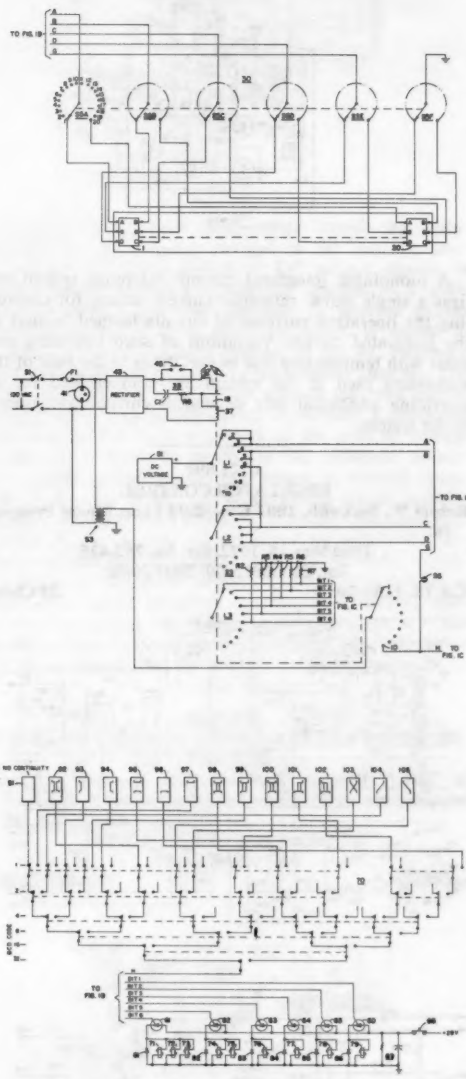
CONTINUITY TEST AND INDICATING CIRCUIT

John T. Haywood, Burlington, N.C., assignor to The United States of America as represented by the Secretary of the Army

Filed Oct. 6, 1971, Ser. No. 187,034

Int. Cl. G01r *15/12, 31/02*

U.S. Cl. 324—73 R **1 Claim**

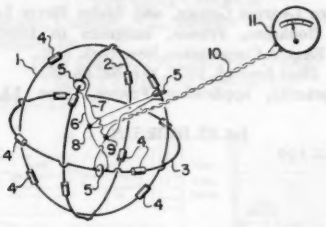


The circuitry of modules is checked by the use of a switching device which selectively connects all possible combinations of pairs of terminals of a selected module to a sensing circuit. The sensing circuit enables a selective SCR when there is continuity between the selective pairs of terminals. The enabled SCRs cause a further switching system to be programed in a binary fashion whereby the switching system will power an indicator to visually show all the connections in the module.

3,721,900
MICROWAVE DETECTION INSTRUMENT AND ANTENNA THEREFOR

Charles Luther Andrews, Albany, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed April 15, 1971, Ser. No. 134,142
Int. Cl. G01r *23/04*
U.S. Cl. 324—95 12 Claims

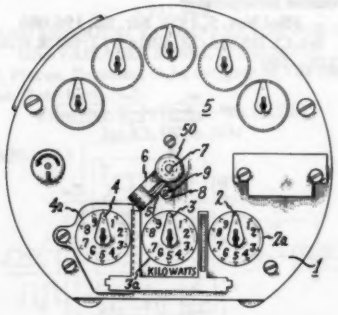


An instrument for detecting microwave energy over half a total solid angle in space and capable of measuring either plane or elliptically polarized waves in all directions employs an antenna having three geometrically and electrically symmetrical diode detector circuits connected in parallel to detect both electrical and magnetic fields, the sole source of power for the circuits being the microwaves detected, the total output current of the parallel circuits being supplied to a meter.

3,721,901
ZERO-RESET MECHANISM FOR AN INDICATING DEMAND REGISTER

Donald M. Ham, Rochester, N.H., assignor to General Electric Company

Filed Aug. 24, 1971, Ser. No. 174,460
Int. Cl. G01r *19/16*
U.S. Cl. 324—103 R 9 Claims

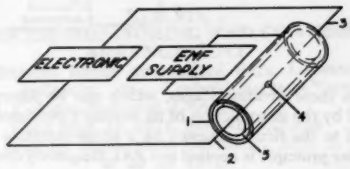


A zero-reset mechanism is provided for accurately and consistently resetting the rotatable indicating pointers of a dial register of a demand meter to zero. The reset mechanism includes a pre-loaded spring that cooperates with an adjustable stop member to return the indicating pointers of the dial register to their zero positions, after they have been manually driven in a down-scale direction past their zero indicating position.

3,721,902
THERMAL SENSING OF CURRENT CARRYING MEDIUMS

Warren C. Burks, 4186 Inglewood, Anaheim, Calif., and Jack G. Lawrence, 11242 Barclay Dr., Garden Grove, Calif.

Filed March 10, 1970, Ser. No. 18,237
Int. Cl. G01r *5/26*; H02h *5/04*
U.S. Cl. 324—106 1 Claim



Thermal conditions of an electrical current carrying medium are made known by locating a thermal sensing device within the body structure of the current carrying medium.

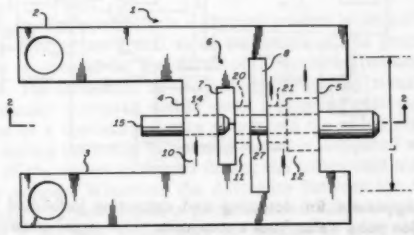
ERRATUM

For Class 324—43 R see:
Patent No. 3,721,984

3,721,903
HIGH FREQUENCY MIXER AND MODULAR REPLACEABLE ELEMENT THEREFOR

William B. Day, Dunedin, Fla., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Nov. 17, 1971, Ser. No. 199,704
Int. Cl. H04b *1/26*
U.S. Cl. 325—445 7 Claims



A high frequency diode microwave frequency converter or mixer has its active mixer diode element mounted in a wave guide slot in a replaceable module also including an output intermediate frequency transmission line. The module is clamped into position in a module holder having a passage coupling to the module wave guide slot and at the same time furnishing walls for a high frequency rejection resonant cavity slot cooperating with the intermediate frequency transmission line.

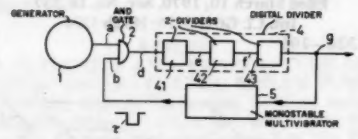
3,721,904
FREQUENCY DIVIDER

Leonardus Adrianus Johannes Verhoeven, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 22, 1971, Ser. No. 117,360
Claims priority, application Netherlands, March 7, 1970, 7003278
Int. Cl. H03k *23/24*
U.S. Cl. 328—39 5 Claims

A signal frequency is divided by a number $m=n+j$ by means of an n-divider based, for example, on digital principles. The output pulses of the n-divider switch a monostable multivibra-

tor which blocks an AND-gate during *j*-pulses of the input signal. The input pulses have to pass the AND-gate so that the frequency is divided by $(n+j)$. If the *n*-divider consists of various dividing stages, phase transitions occur in the signal

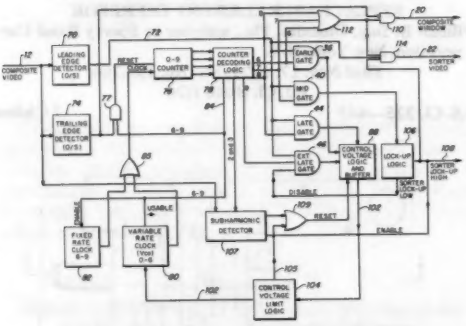


between these dividing stages, which can be filtered out or avoided by the introduction of an auxiliary oscillator which is coupled to the first frequency by a phase-sensitive detector. The latter principle is applied in a PAL frequency divider.

3,721,905
PULSE TRAIN SORTER

Walter C. Newman, Sunnyvale, and Andrew R. Cohen, Delmar, both of Calif., assignors to Itek Corporation, Lexington, Mass.

Filed Aug. 11, 1971, Ser. No. 172,339
Int. Cl. H03k *5/20*
U.S. Cl. 328—109 **34 Claims**

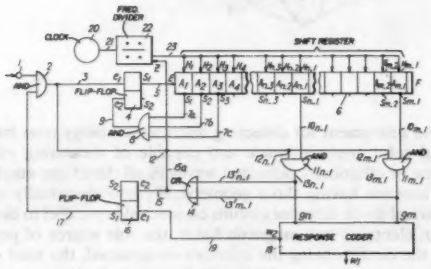


Apparatus for detecting and extracting individual signal video pulse trains from a composite video signal consisting of many individual signal video pulse trains. The apparatus includes a plurality of electronic channels each of which is capable of locking onto an individual signal video pulse train having a pulse repetition frequency (PRF) over a wide bandwidth. The first electronic channel locks up to the signal video pulse train having the highest PRF. After lock-on the channel gates that signal video pulse train out of the composite video signal, and directs the remaining composite video signal to the second electronic channel which locks onto the signal video pulse train having the second highest PRF, and gates that signal video pulse train out of the remaining composite video signal. The second channel then gates the then remaining composite video signal to the third electronic channel wherein the same operation is repeated, etc. Each electronic channel searches for a signal video pulse train which may have a PRF within a given range by utilizing gating circuitry which first attempts to gate a signal video pulse train with a high PRF and then in a continuous manner attempts to gate a signal video pulse train with a lower and lower PRF. Lock-on is indicated by the sequential passage through the gating circuitry of a series of video pulses with a particular PRF. After lock-on is indicated, the searching function is terminated for that particular electronic channel. The gating circuitry has early, mid, and late gating windows. The gating circuitry detects which gating window the signal video pulse train is passing through, and the timing of the gating circuitry is then finely adjusted accordingly to gate the signal video pulse train through the mid gating window. In this manner the timing of the gating circuitry may be shifted slightly either forward or backward in time to center the signal video pulse train at the mid gating window.

3,721,906
CODED PULSE PAIR DETECTOR WITH IMPROVED DETECTION PROBABILITY

Michel Pierre Georges Geesen, and Andre Pierre Laganier, both of Boulogne, France, assignors to International Standard Electric Corporation, New York, N.Y.

Filed June 15, 1970, Ser. No. 46,053
Claims priority, application France, June 13, 1969, 6919637
Int. Cl. H03k *5/20*
U.S. Cl. 328—109 **2 Claims**

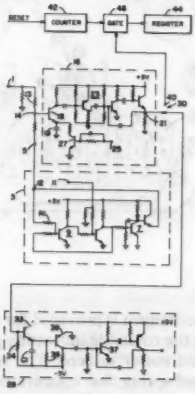


An improved decoder for IFF interrogations is provided to increase the average probability of detection. The first pulse of the pulse pair interrogation is stretched via logic circuitry to increase the probability of coincidence with the second pulse of the interrogation. This allows for a certain amount of variation or jitter in the timing of the incoming pulse pair.

3,721,907
DETECTION OF RANGE MARKS NEAREST THE CENTER OF A RANGE GATE

Robert E. Myer, Denville, N.J., assignor to Bell Telephone Laboratories Incorporated

Filed Nov. 5, 1971, Ser. No. 196,086
Int. Cl. H03k *5/18*; **G01s** *9/12*; **H03k** *4/20*
U.S. Cl. 328—109 **4 Claims**



The range marks coming in are combined with a triangular ramp voltage waveform from a ramp generator. The ramp has

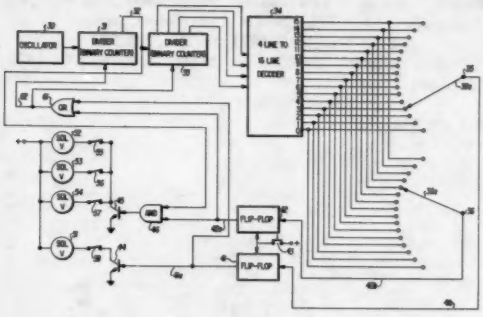
the same width as the range gate and its peak at the center of the gate. The largest amplitude of the combined range mark and triangular ramp is the range mark nearest to the center of the range gate. This is selected by a largest amplitude detector system.

3,721,908

PROGRAMMABLE TIMER FOR CONTROLLING THE INJECTION OF ADDITIVES TO A DRY CLEANING SOLVENT CHARGE

Ojars Jurjans, Camden, N.J., assignor to Jetronic Industries, Philadelphia, Pa.

Filed Aug. 25, 1971, Ser. No. 174,627
Int. Cl. G01r *29/02*; H03k *5/00*
U.S. Cl. 328—131 **7 Claims**



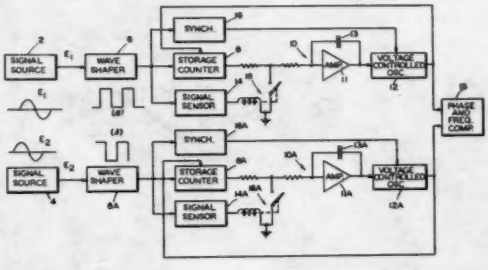
A programmable timer for controlling the proportional and volumetric addition of additives to a dry cleaning solvent charge, utilizes an oscillator, binary counter frequency dividers, and a four line to 16 line decoder to establish selective time reference intervals. Material feed control solenoid valves are controlled by flip-flop circuits. Materials feed is initiated by causing the flip-flip circuits to assume one stable state to energize the solenoid valves, and material feed is terminated by the decoder outputs, indicative of selected time intervals, causing the flip-flop circuits to assume the other stable state to deenergize the solenoid valves.

3,721,909

PHASE AND FREQUENCY COMPARATOR FOR SIGNALS UNAVAILABLE SIMULTANEOUSLY

Ralph M. Pincus, Paramus, N.J., assignor to The Bendix Corporation, Teterboro, N.J.

Filed Dec. 7, 1970, Ser. No. 95,786
Int. Cl. H03b *3/04*
U.S. Cl. 328—133 **7 Claims**



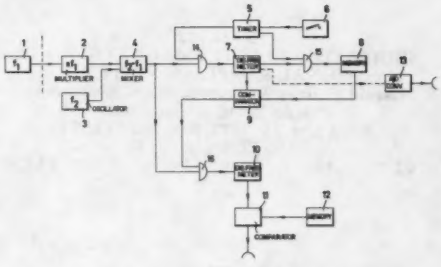
A phase and frequency comparator for input signals unavailable simultaneously includes a channel for each of the signals, each channel having a wave shaper for providing a square wave corresponding to the signal, a storage counter driven by the wave shaper and an oscillator driven by the storage counter and connected in feedback relation to the counter so that the counter output is zero when the oscillator frequency equals the square wave frequency, with means provided for thereupon rendering the oscillator output frequency constant. The oscillator output is synchronized by the input signal and since the oscillator output is steadily available a conventional phase and/or frequency comparison can be made.

3,721,910

PROCESS MONITORING AND CONTROL ARRANGEMENT

Ingo Wilmanns, Bruhl, and Alfred Barz, Lohmar, Germany, assignors to Leybold-Heraeus-Verwaltung GmbH, Cologne-Bayental, Germany

Filed Mar. 31, 1971, Ser. No. 129,816
Claims priority, application Germany, Apr. 3, 1970, P 20 15 957.3
Int. Cl. H03b *3/04*
U.S. Cl. 328—141 **8 Claims**



A switching operation in a physical process is controlled by monitoring an actual value parameter of the process which is present in the form of a variable frequency signal. The frequency of the variable frequency signal is periodically measured within given measuring periods by means of a digital frequency meter and the value measured during the initial measuring period is compared with each of the values measured during the subsequent measuring periods. Whenever the difference between the two compared values reaches a predetermined value a control signal is initiated which may be utilized to control the switching operation of the process. According to a preferred embodiment of the invention the control signal is initiated whenever the subsequently measured value is at least equal to the initially stored value and is utilized to gate the variable frequency signal representative of the actual value parameter to a further digital frequency meter. The measured output value of this further digital frequency meter is then compared with a given fixed reference value to initiate a control signal for the switching operation of the process whenever the measured value is equal to or exceeds the fixed value.

3,721,911

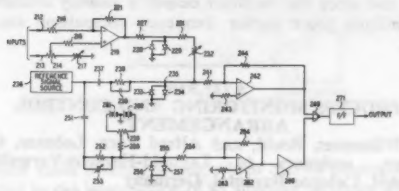
TRIGGER CIRCUIT HAVING THE SAME LEVEL TURNON AND TURNOFF THRESHOLDS

William Louis Aranguren, Sayreville, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill and Berkeley Heights, N.J.

Filed Sept. 23, 1971, Ser. No. 183,075
Int. Cl. H03k *5/20*
U.S. Cl. 328—146 **3 Claims**

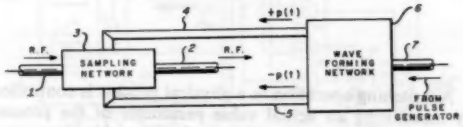
A trigger circuit produces an output signal to indicate that the amplitude of a first input signal exceeds the amplitude of a second input signal. The two input signals are applied to a differential amplifier, which modulates the

pulse width of a reference signal in accordance with the difference between the two input signals by biasing a pair of oppositely poled diodes. The modulated signal is compared with the unmodulated reference signal by a logic gate to produce an output only when the modulated pulse



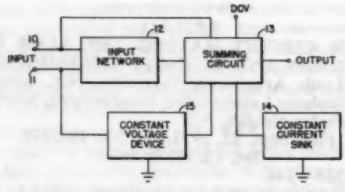
is not in coincidence with the unmodulated pulse. The output signal from the logic gate triggers a flip-flop circuit which divides by two to provide an output signal which indicates that the first input signal is greater than the second input signal.

3,721,912
SHORT TIME ELECTROMAGNETIC WAVE SIGNAL SAMPLING SYSTEM
Gerald F. Ross, Lexington, Mass., assignor to Sperry Rand Corporation
Filed Apr. 19, 1971, Ser. No. 134,991
Int. Cl. H03k 5/13
U.S. Cl. 328—151 **13 Claims**



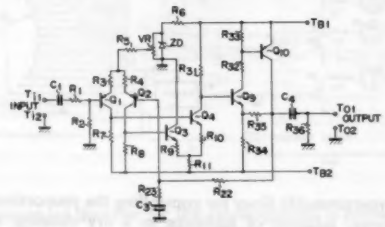
An electromagnetic wave signal sampling system for taking wave samples of duration of the order of a nanosecond is provided by employment of short-duration, equal and opposite, simultaneous sampling pulses derived within a novel transmission line wave forming network as balanced sampling signals for the operation of a novel balanced transmission line sampling network.

3,721,913
DC TO SUB-MICROSECOND FREQUENCY CHANGE DETECTOR
Donald J. Theobald, Lajolla, Calif., assignor to The United States of America as represented by the Secretary of the Navy
Filed Sept. 2, 1971, Ser. No. 177,295
Int. Cl. H04l 27/22; H04k 9/00
U.S. Cl. 329—102 **10 Claims**



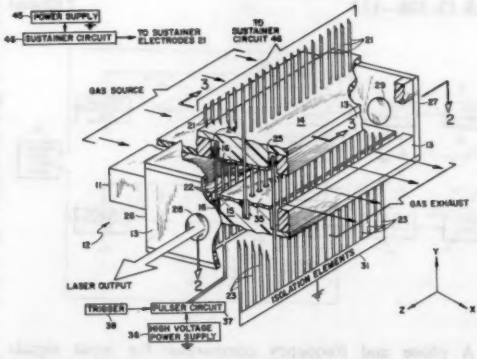
An input network phase shifts received signals by substantially 180° and also attenuates received signals as a function of the frequency. A summing circuit receives the phase shifted signal as well as the unaltered received signal, to develop signals as a function of the instantaneous difference in amplitude between them. The summing circuit includes a constant current sink connecting it to ground and a constant voltage device connecting the low potential side of the summing circuit to the low potential side of the unaltered received signals as a reference. In its preferred embodiment the frequency change detector is capable of detecting such frequency changes within one cycle of the received signals for frequencies ranging from dc to the multi-MHz range.

3,721,914
DIFFERENTIAL AMPLIFIER HAVING BALANCED CURRENT FLOW
Hajime Nakamura, Kita Nishiogi, Suginami-ku, Tokyo, Japan, assignor to Sansui Electric Co., Ltd., Tokyo, Japan
Filed March 25, 1971, Ser. No. 128,083
Claims priority, application Japan, March 27, 1970, 45/25461
Int. Cl. H03f 3/18, 3/68
U.S. Cl. 330—25 **2 Claims**



A two-stage differential amplifier wherein the supply of voltage and current to a first stage differential amplifier circuit is controlled and a direct current from the output side of a second stage differential amplifier circuit is fed back to said first stage circuit.

3,721,915
ELECTRICALLY EXCITED FLOWING GAS LASER AND METHOD OF OPERATION
James P. Reilly, Lexington, Mass., assignor to Avco Corporation, Cincinnati, Ohio
Continuation-in-part of Ser. No. 859,424, Sept. 19, 1969, abandoned. This application June 29, 1970, Ser. No. 50,933
Int. Cl. H01s 3/00
U.S. Cl. 331—94.5 PE **50 Claims**



A method of and apparatus for producing spatially uniform discharges including producing laser action in a flowing gas by

electrical means using first means to create electrons and second means to maintain the optimum electron environment to produce lasing action.

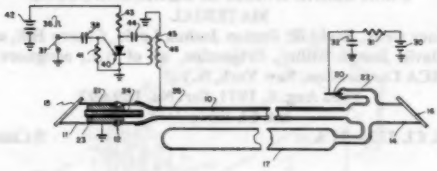
Apparatus for and a method of producing spatially uniform discharges substantially throughout a large volume of gaseous medium by generating in an enclosure a substantially uniform density of free electrons in the medium and controlling the electron temperature of the free electrons to increase their average energy without substantially increasing their density that at a predetermined level and uniformity of both the density and temperature of the medium, a stable and uniform discharge is produced in the medium suitable for the intended use of the medium such as the generation and amplification of light waves by means of devices including gaseous media in which stimulated emission of radiation is provided by electrical means to create free electrons and maintain the optimum electron environment to produce lasing action, there being a particular relationship between the density of free electrons, gas pressure and gas velocity.

3,721,916

COLD CATHODE CONSTRUCTION FOR GASEOUS LASER

Robert S. Witte, Redondo Beach; C. Lee Dailey, Palos Verdes Estates; Milford J. Eck, Anaheim, and Walter H. Rutherford, Clearlake Highlands, all of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed April 28, 1971, Ser. No. 138,141
Int. Cl. H01s 3/09
U.S. Cl. 331—94.5 **5 Claims**



A gaseous laser of the type having a coaxial cold cathode constructed to minimize sputtering of the windows of the laser. The laser is preferably an argon or xenon-ion laser with an indium cathode disposed at one end of the insulating envelope and surrounding an insulating tube which extends in a direction toward the anode to minimize sputtering. Alternatively, both cathode and anode may consist of indium and may be disposed on the outside of the end portions of the laser envelope with the end portions extending beyond the electrodes and towards each other.

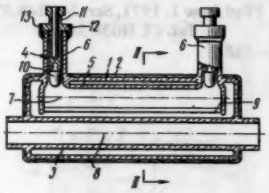
3,721,917

GAS-DISCHARGE DEVICES FOR OPTICAL PUMPING OF LASERS

Nikolai Ivanovich Sereda, Zelengrad, korpus 503, kv. 18; Viktor Viktorovich Sysun, Zelengrad, korpus 707, kv, 71; Boris Vasilievich Skvortsov, Zelengrad, korpus 511, kv. 58; Viktor Davydovich Fisher, ulitsa Tuchkovskaya, 9, kv. 151, and Alexandr Vasilievich Tolstoshev, Inovokuznetsky pereulok, 10, kv. 18, all of Moscow, U.S.S.R.

Filed June 17, 1971, Ser. No. 153,972
Int. Cl. H01s 3/09
U.S. Cl. 331—94.5 **4 Claims**

A gas-discharge device for optical pumping of lasers, in which a gas-filled chamber encloses an optically transparent laser-material holding tube and at least one optically transparent cylindrical discharge tube. This discharge tube is arranged inside the chamber so that the electrode assemblies between which an electric discharge is initiated to produce a gas-discharge plasma are found inside the discharge tube



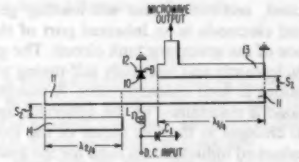
which has a slot to allow part of the plasma to spill over into the chamber.

3,721,918

NEGATIVE RESISTANCE SEMICONDUCTOR COUPLED TRANSMISSION LINE APPARATUS

Arye Rosen, Elkins Park, Pa., and James Francis Reynolds, Hightstown, N.J., assignors to RCA Corporation

Filed Feb. 24, 1972, Ser. No. 229,145
Int. Cl. H03b 7/14
U.S. Cl. 331—96 **8 Claims**



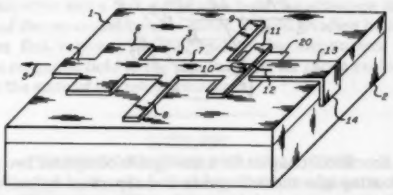
The boundary conditions for operating an avalanche diode in the anomalous mode are solved by coupling the diode between the center conductor and ground conductor of a first TEM mode transmission line. Center conductors of additional TEM mode transmission lines, providing different electrical parameters, are capacitively coupled to different sections of the center conductor of the first TEM mode transmission line.

3,721,919

HIGH EFFICIENCY MODE PLANAR MICROCIRCUIT HIGH FREQUENCY SIGNAL GENERATOR

Martin I. Grace, Framingham, Mass., assignor to Sperry Rand Corporation, New York, N.Y.

Filed March 13, 1972, Ser. No. 234,177
Int. Cl. H03b 7/14
U.S. Cl. 331—96 **9 Claims**

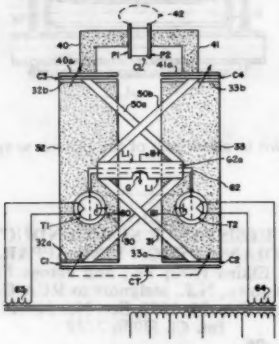


An active high-efficiency-mode semiconductor diode is coupled for the generation of oscillating high frequency electromagnetic fields in a planar transmission line network, the apparatus taking the form of a single port, high frequency oscillator device. Oscillations are sustained by time delayed triggering phenomenon within the TRAPATT semiconductor diode.

3,721,920
SELF-EXCITED COMPOSITE CAPACITANCE AND INTERLOCKING INDUCTANCE OSCILLATOR

Julius W. Mann, 9132 De Koven Drive, S.W., Tacoma, Wash.

Filed June 1, 1971, Ser. No. 148,578
Int. Cl. H03b 5/18
U.S. Cl. 331—168 3 Claims

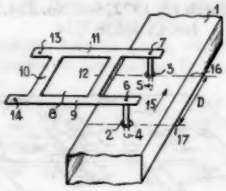


A self-excited, self-tuning and self-loading generator in which the load electrode is an inherent part of the capacity and inductance of the generator tank circuit. The generator is automatically, instantly and steplessly self-tuning with respect to wide variations in load characteristics. A maximum power input to the load is maintained by the generator and this is in proportion to changes in the loss factor of the load. A composite or interlocked inductance is used for the load electrode and the tank circuit. Series coupling condensers are used in the load circuit and leads from these coupling condensers are crossed and their terminals are connected to the composite inductance thus interlocking the composite inductance with the load circuit. This is why I term the composite inductance an interlocked inductance.

3,721,921
WAVEGUIDE DIRECTIONAL COUPLER

Michel Lamy, and Jacques Billard, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Oct. 6, 1971, Ser. No. 187,110
Claims priority, application France, Oct. 13, 1970, 7036927
Int. Cl. H01p 5/12, 5/14, 3/08
U.S. Cl. 333—10 1 Claim

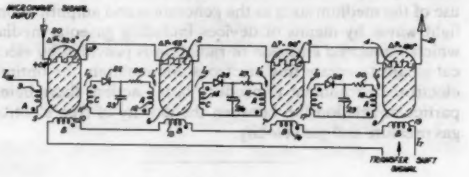


A directional coupler for a waveguide comprises two probes penetrating into the waveguide and separated by an interval equal to a quarter of the wavelength corresponding, in the guide, to the operating frequency. The two probes are connected to two ports of a square hybrid, the length of the side of which is equal to a quarter of the wavelength corresponding, in the hybrid, to the above-mentioned frequency. The square hybrid may be detached from the waveguide either through making the probes integral with the hybrid, or through making them the extensions of coaxial jacks integral with the guide, the hybrid being then provided with two mating plugs.

3,721,922
COMPOSITE DIGITAL LOGIC MICROWAVE PHASE SHIFTER

Donald W. Boensel, La Canada, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Dec. 2, 1970, Ser. No. 94,510
Int. Cl. H01p 1/32
U.S. Cl. 333—24.1 6 Claims

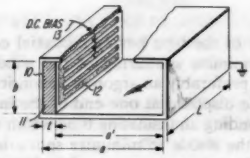


A microwave phase shifter comprising a strip transmission or meander line associated with a ferrimagnetic toroid or ferrimagnetic substrate divided into discrete operative regions. These discrete operative regions form the magnetic memory elements of a digital logic function. The device thus operates as a digitally controlled phase shifter in which the ferrimagnetic elements serve the dual purpose of operating on the digital control code signals as memory elements, while simultaneously effecting stage-by-stage phase shift of the microwave energy in the said meander line or strip-line.

3,721,923
COMPRISING A SLAB OF SEMICONDUCTOR MATERIAL

Sidney Gray, Rockhill; Burton Joshua Levin, Cherry Hill, and David Joseph Miller, Brigantine, all of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Aug. 6, 1971, Ser. No. 169,692
Int. Cl. H01p 1/18
U.S. Cl. 333—31 A 8 Claims



A slab of semiconductive material is positioned inside a rectangular waveguide transmission line to electrically change the phase shift within a waveguide. The slab is provided with two electrodes to which a D.C. bias signal is applied; the bias signal varies the conductivity of the semiconductor material to produce the desired phase shift by changing the effective dimensions of the waveguide.

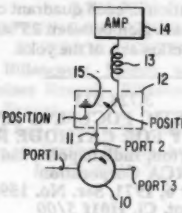
3,721,924
VARIABLE DELAY LINE UTILIZING ONE PART REFLECTION TYPE AMPLIFIER

Bertrand Edward Berson, Trenton, and Chainulu Lakshminarsimha Upadhyayula, Cranbury, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed May 19, 1971, Ser. No. 144,878
Int. Cl. H01p 1/18
U.S. Cl. 333—31 R 5 Claims

A microwave delay line includes a first path of negligible delay time, a second path providing a predetermined delay

time determined by a delay line section terminated by a one port reflection type amplifier, and a control for selectively



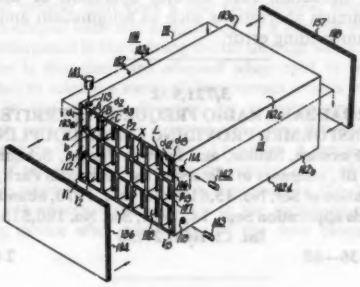
feeding a microwave signal over one of the paths. A signal can be held in the delay line section of the second path to thereby impart a desired delay to that signal.

3,721,925

SOUND SIGNAL DELAY DEVICE

Noboru Tsuchiya, Kanagawa-ken, and Hirotake Kawakami, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed May 21, 1971, Ser. No. 145,823
Claims priority, application Japan, May 21, 1970, 45/49633
Int. Cl. H03n *7/30*
U.S. Cl. 333—30 **4 Claims**



A sound signal delay device having an airtight box, a plurality of partition walls forming a meandering channel in said box, a loudspeaker mounted on said box, and a microphone mounted on said box in spaced relation to said loudspeaker, whereby a sound produced by said loudspeaker is picked up as a delayed sound signal by the microphone.

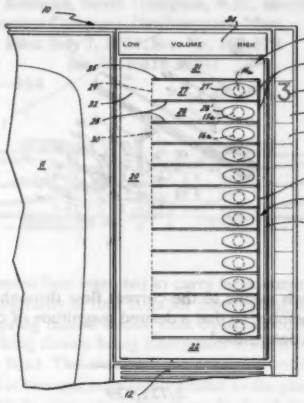
3,721,926

KEY-OPERATED TELEVISION CHANNEL SELECTOR

Arthur Berenbaum, Holland, and Robert M. McDonough, Philadelphia, both of Pa., assignors to Philco-Ford, Philadelphia, Pa.

Filed April 1, 1971, Ser. No. 130,336
Int. Cl. H03j *5/08;* **H04b** *1/08;* **H01h** *3/12*
U.S. Cl. 334—7 **2 Claims**

Television receiving apparatus including a presettable tuner having a plurality of plunger-actuated, frequency-determining, elements with which the operator can select desired VHF and UHF stations. The actuating elements are normally concealed behind a control panel door, and the door is so constructed that portions thereof define a plurality of deflectable keys any one of which may be depressed to engage and operate an underlying tuning element. The door, including the



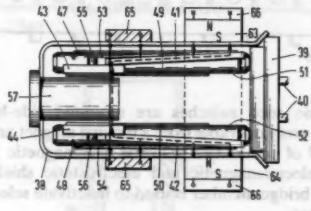
keys, may be moved to open position to accommodate presetting of desired frequency channels.

3,721,927

BISTABLE POLARIZED ELECTROMAGNETIC RELAY

Gundokar Braumann; Helmut Stocker, and Dieter Hillenbrand, all of Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed July 30, 1971, Ser. No. 167,567
Int. Cl. H01h *5/22*
U.S. Cl. 335—179 **20 Claims**



A bistable electromagnetic relay is disclosed including two movable armatures whose free ends occupy one of two stable states. The armatures cooperate with stationary counter poles to define air gaps. Permanent magnets including a flux return path longitudinal to the armature, through the air gaps and a magnetic core and a flux guide bow hold the armature stable in one of the no-current stable states. A field winding having a separate flux return path diagonal to the longitudinal permanent magnetic field in the region of the air gap is excited to change the state of the relay armatures.

3,721,928

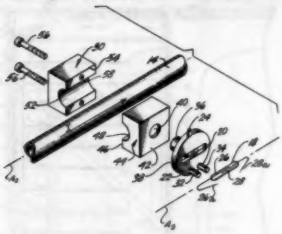
CURRENT MONITORING APPARATUS

Carlos E. Buonavita, San Gabriel, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed April 29, 1971, Ser. No. 138,554
Int. Cl. H01h *9/00*
U.S. Cl. 335—204 **5 Claims**

A method and apparatus is disclosed for detecting when the current flowing through a current carrying member reaches a predetermined magnitude. Switch means responsive to the magnetic field about the member is mounted adjacent the current carrying member. Additionally, adjustable means are in-

cluded for selectively varying the sensitivity of the switch means to the magnetic field in order to control the sensitivity



of the switch means to the current flow through the current carrying member so that a desired magnitude of current to be detected is determined.

3,721,929

ELECTRICAL SWITCH DEVICES

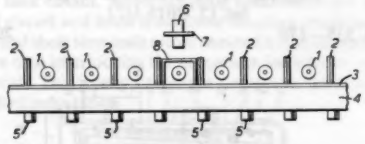
Ralph Parton Gabriel, Chobham Nr. Woking, Surrey, and Rupert Ivor Kinross, Shepperton, Middlesex, both of Great Britain, assignors to Communications Patents Limited, London, England

Filed Aug. 26, 1971, Ser. No. 17,507

Claims priority, application Great Britain, Aug. 28, 1970, 41,538/70

Int. Cl. H01h *36/00, 41/04*

U.S. Cl. 335—206 **6 Claims**



Magnetic reed switches are mounted side-by-side in a switching array operable from a moving magnet and located in a channel of conductive material and magnetic members to provide electromagnetic and electrostatic shielding and a magnetic bridge member is used to inactivate selected ones of the switches.

3,721,930

DEFLECTION YOKE FOR USE WITH IN-LINE ELECTRON GUNS

William Henry Barkow, Pennsauken, and Josef Gross, Princeton, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Jan. 14, 1972, Ser. No. 217,768

Int. Cl. H01f *7/00*

U.S. Cl. 335—213 **6 Claims**

A deflection yoke for a television picture tube utilizing coplanar horizontal in-line electron guns includes vertical and horizontal coil windings selected for producing positive vertical isotropic astigmatism and negative horizontal isotropic astigmatism which underconverges the electron beams along the vertical deflection axis such that the beams are substantially converged at all points on a scanned raster of the picture tube. The desired convergence characteristics are achieved by winding the vertical and horizontal coil conductors such that the conductor distribution in each quadrant of a cross-section of the yoke is least in a region between 25° and 45° measured from the vertical deflection axis of the yoke.

3,721,931

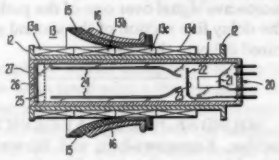
ELECTROMAGNETIC FOCUSING AND DEFLECTION ASSEMBLY FOR CATHODE RAY TUBES

James Hugh Wharton, Indianapolis, Ind., assignor to RCA Corporation

Filed July 6, 1971, Ser. No. 159,810

Int. Cl. H01f *5/00*

U.S. Cl. 335—213 **11 Claims**



A deflection coil assembly for an image conversion tube such as a vidicon has the active field producing conductors flared away from the central longitudinal axis of the vidicon at the end adapted to be closest to the target electrode. A focusing coil assembly which may be disposed coaxially inside of the deflection coil assembly provides a nonuniform magnetic field which in conjunction with the deflection field enables operation of the tube with minimum aberrations such as astigmatism and minimum beam landing error.

3,721,932

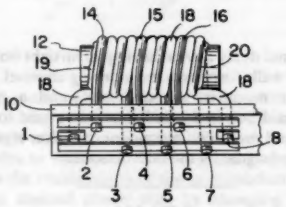
BROADBAND RADIO FREQUENCY FERRITE TRANSFORMER PROVIDING CLOSE COUPLING

Gary N. Fierstien, Skokie, and Paul H. Jacobs, Schaumburg, both of Ill., assignors to Motorola, Inc., Franklin Park, Ill.

Continuation of Ser. No. 15,619, March 2, 1970, abandoned. This application Sept. 14, 1971, Ser. No. 180,515

Int. Cl. H01f *27/30*

U.S. Cl. 336—65 **2 Claims**



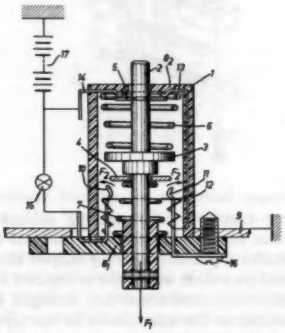
A broadband radio frequency transformer for use in the frequency range from 25 to 175 megahertz includes closely coupled windings on a ferrite rod providing low leakage inductance. A plurality of primary coils and a single continuous secondary coil are provided, with each primary coil bifilar wound with a portion of the secondary coil. The number of turns in the secondary coil is equal to the total number of turns in all the primary coils, or may be up to 50% greater than the total number of turns in the primary coils. The primary coils are connected in parallel to provide a step-up transformer having an impedance ratio related to the ratio of the number of turns in each primary coil to the number of turns in the

secondary coil. The single coil can be used as the primary winding and the plurality of coils connected in parallel as the secondary winding for an impedance step-down transformer.

3,721,933
DELAYED-OPENING SWITCHES FOR VEHICLES INTERIOR LIGHTING

Francois Peroy, Billancourt, France, assignor to Regie Nationale Des Usines Renault, Billancourt and Automobiles Peugeot, Paris, France

Filed Aug. 5, 1971, Ser. No. 169,179
Claims priority, application France, Aug. 18, 1970, 30286
Int. Cl. H01h *71/16*
U.S. Cl. 337—66 **4 Claims**

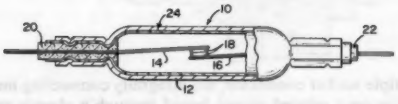


This door-jamb switch for controlling the interior lighting of a motor vehicle comprises a pair of bimetallic strips having contact-shaped ends and surrounded by a heating wire; these strips interposed in the lighting circuit through which the heating wire is energized are adapted when cold to retain and when hot to release a metal sliding contact washer constantly urged in the release direction by a spring and retained between said strips by a control rod when the latter is not depressed by the door in its closed position. A metal disk rigid with said rod is adapted to close the supply circuit of said heating wire when the control rod is depressed by the door. This switch introduces a delay-action in the switching-off of the lighting device after completion of the door closing movement.

3,721,934
THERMOSTAT HAVING POSITIVE INSULATING LINER

Alton R. Wells, 4573 W. Tradewinds Avenue, Lauderdale-by-the-Sea, Fla.

Filed Aug. 31, 1971, Ser. No. 176,661
Int. Cl. H01h *45/02*
U.S. Cl. 337—112 **6 Claims**

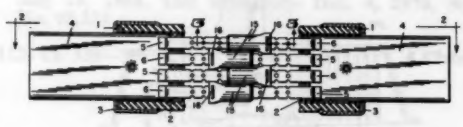


A thermal control or protector having a conductive casing with two bi-metal arms extending as cantilevers into the casing from the ends thereof. The bi-metal arms have insulating sleeves therearound and a continuous insulating liner is provided that extends the length of the casing adjacent the wall thereof and protrudes beyond the ends of the casing for positive insulation thereof.

3,721,935
HIGH CURRENT- CARRYING-CAPACITY DUAL ELEMENT FUSE

Frederick J. Kozacka, South Hampton, N.H., assignor to The Chase-Shawmut Company, Newburyport, Mass.

Filed July 7, 1971, Ser. No. 160,379
Int. Cl. H01h *85/04*
U.S. Cl. 337—164 **7 Claims**

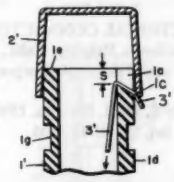


A dual element fuse intended to carry large currents is provided with a plurality of fuse links for interrupting major fault currents, a spring biased solder joint overload current interrupting switching device being interposed in each of said plurality of fuse links. The overload current interrupting devices are arranged in two spaced planes parallel to the plane defined by the two blade contacts of the fuse. Each of the overload current switching devices includes a fixed terminal and movable terminal both enclosed in a sub-casing of electric insulating material, separating the aforementioned terminals from a body of pulverulent arc-quenching filler. The terminals are arranged in a pattern tending to maximize the spacing between furlgurites resulting from backburn of fuse links beyond the sub-casings incident to interruption of overload currents the interruption of which is relatively onerous.

3,721,936
CARTRIDGE FUSE HAVING BLOWN FUSE INDICATOR

Richard A. Belcher, Hampton Falls, N.H., assignor to The Chase-Shawmut Company, Newburyport, Mass.

Filed March 29, 1972, Ser. No. 239,090
Int. Cl. H01h *85/30*
U.S. Cl. 337—241 **5 Claims**



A cartridge fuse is provided with a blown fuse indicator spring-biased to an indicating position and normally held in its non-indicating position by means of a restraining wire. The fuse includes effective mechanical means rather than a solder joint for precluding undesired slippage of the restraining wire. To achieve this end the tubular casing of the fuse is provided with a substantially transverse opening, and the restraining wire is threaded through said opening and forms a loop firmly anchoring the end of the restraining wire formed into the loop and clamped by the lateral surface of a ferrule against the outer surface of the casing of the fuse.

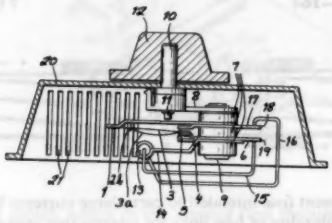
3,721,937
ELECTRIC TEMPERATURE REGULATOR

Peter Schuller, Wilhelm-Raabe-weg 4A, 3006 Grossburgwedel, Germany

Continuation-in-part of Ser. No. 736,087, June 11, 1968, Pat. No. 3,525,222. This application June 8, 1970, Ser. No. 44,530
Int. Cl. H01h *37/52*
U.S. Cl. 337—335 **3 Claims**

A thermostat for a refrigerator has a pair of substantially parallel bimetallic elements exposed to the atmosphere of the

refrigerator compartment and adapted to bend in opposite directions on temperature variation. Attached to the free end of one of the strips is an elongated element which carries a contact engageable with a fixed contact to close a circuit that operates the refrigerator compressor. Extending between the



free end of the other strip and the movable contact is a leaf spring. Both of the free ends move in opposite directions with one of these free ends traversing a line extending from the other free end to the movable contact, thereby forming a toggle linkage for snapping the contacts open and closed, depending on the direction of temperature change.

3,721,938

CADMIUM TELLURIDE DEVICES WITH NON-DIFFUSING CONTACTS

Gerald Entine, Newton; Franklin H. Cocks, Waltham, and Carl Rice Mitchell, Watertown, all of Mass., assignors to Tyco Laboratories Incorporated, Waltham, Mass.

Filed Dec. 23, 1971, Ser. No. 211,723
Int. Cl. H01c *7/08*
U.S. Cl. 338—15 **6 Claims**

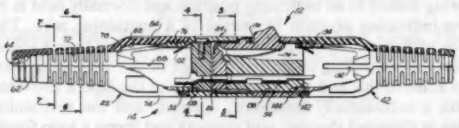
A method of providing non-diffusing contacts for cadmium telluride semiconductor devices, notably photodetectors. The contacts consist of iridium applied by sputtering and are low resistance, but also photosensitive at 400°C.

3,721,939

ELECTRICAL CONNECTOR

Edward C. Paugh, Hacienda Heights, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed July 6, 1971, Ser. No. 159,841
Int. Cl. H01r *3/06*
U.S. Cl. 339—14 R **2 Claims**



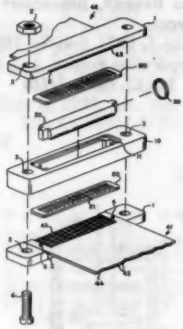
An electrical connector assembly is formed of a pair of concentric members with the outer concentric member being internally threaded at its front end and inwardly tapered towards its rear end. The inner concentric member is externally threaded for mating with the outer member. Upon threadably mating of the concentric members, the inner member is radially compressable at one end for securing the inner member to an electrical conductor. Moreover, step-sized collets, which are removable, are provided at the rear inner surface of the outer member so as to accommodate various diameter electrical conductors. Grounding shell members may be mounted in the connectors with mating of the connectors causing an electrical interconnection between the grounding shells.

3,721,940

CONNECTOR FOR MULTI-CONDUCTOR TAPE CABLE

Donald E. Michel; LeRoy W. Fairbairn, and James E. Cook, all of Sidney, N.Y., assignors to The Bendix Corporation, Southfield, Mich.

Filed Sept. 15, 1971, Ser. No. 180,801
Int. Cl. H01r *13/36, 13/54;* **H05k** *1/04*
U.S. Cl. 339—17 F **16 Claims**



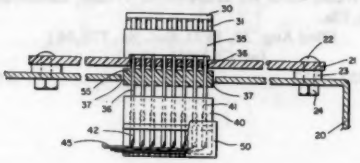
An electrical connector for making solderless contact between two flat multiple-conductor electrical cables. The connector includes a plurality of ring shaped electrical conductors mounted on a shaft within the connector housing. The ring shaped electrical conductors are arranged in the same spaced relationship as the conductors in the tape cable and when the tape cables are inserted into the housing they connect each of the conductors of the first cable in electrical circuit relationship to the electrical conductors of the second cable. In one embodiment, the shaft is rotatable so that should an oxide build up between the ring contacts and the electrical conductors of the tape cable, the electrical contacts may be rotated in contact with the tape conductors to clean the surface of oxide and reduce the resistivity between the contacting surfaces.

3,721,941

MULTIPLE SOCKET CONNECTOR APPARATUS

William L. Wisser, Ambler, Pa., assignor to Narco Scientific Industries, Inc., Fort Washington, Pa.

Filed Nov. 3, 1971, Ser. No. 195,208
Int. Cl. H05k *1/02*
U.S. Cl. 339—17 CF **3 Claims**

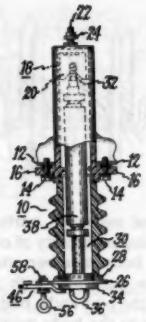


A multiple socket connector, for integrally connecting multiple points on a printed circuit board through a chassis to a system harness. An integrated circuit is connected to a wire wrap type printed circuit socket, the pins of which connect to and extend through the printed circuit board, and which also extend through a chassis opening and connect to a mating dual-in-line IC socket. The output leads of the IC socket are connected to the system harness. A spacer may be provided between the two sockets to insulate the wire wrap leads from the chassis.

3,721,942
LOCK PLATE FOR HIGH VOLTAGE BUSHINGS WITH REMOVABLE CONNECTORS

Gerard V. Conway, Pittsfield, Mass., assignor to General Electric Company

Filed Dec. 3, 1971, Ser. No. 204,560
Int. Cl. H01r *13/54*
U.S. Cl. 339—75 R 7 Claims

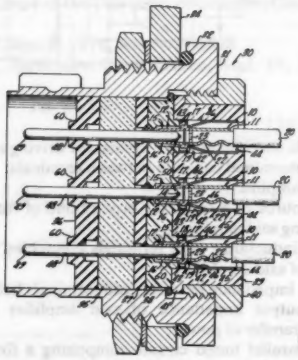


A high voltage bushing for electrical apparatus, such as transformers. The bushing is hollow and has provisions for receiving either a fuse connector or a solid connector. A lock plate is provided which mounts on the terminal plate of the bushing and prevents withdrawal of the connector while the lock plate is attached to the terminal plate. The lock plate is provided with an eyebolt connector for attaching to the terminal plate. Slots are also provided in the lock plate or connecting one or more high voltage cable leads thereto.

3,721,943
ELECTRICAL CONNECTING DEVICE

Maurice D. Curr, Idyllwild, Calif., assignor to The Deutsch Company, Electronic Components Division, Banning, Calif.

Filed Jan. 21, 1969, Ser. No. 792,704
Int. Cl. H01r *13/52*
U.S. Cl. 339—94 M 3 Claims

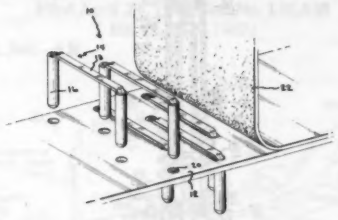


This invention includes a socket contact of sheet metal, which is formed to a tubular configuration from a flat piece having a malleable portion at one end and a resilient portion at the other. The malleable portion is crimped to an adjoining wire, while the resilient portion provides a spring force for gripping a mating pin. The latter element may be permanently mounted in the connector and extend through a sealing member such as rubber or glass. The pin extends outwardly for insertion into the socket contact of an adjoining connector section.

3,721,944
FLEXIBLE STRIP FOR ELECTRICAL CONNECTORS OR THE LIKE

Charles Harry Weidler, Lancaster, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation of abandoned application Ser. No. 748,551, July 29, 1968. This application Dec. 4, 1970, Ser. No. 95,334
Int. Cl. H01r *31/08*
U.S. Cl. 339—19 4 Claims

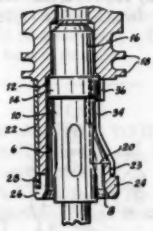


An electrical interconnection strip comprising a first layer of insulating material, a plurality of pin members extending through the first layer, and a second layer of insulating material adhesively connected or otherwise secured to the first layer and securing the pin members to the strip.

3,721,945
INTEGRATED WIRE TERMINATION SYSTEM WITH INTEGRAL RETAINER

Harold W. Hults, New Berlin, Wis., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Sept. 9, 1971, Ser. No. 179,109
Int. Cl. H01r *13/54*
U.S. Cl. 339—74 R 8 Claims

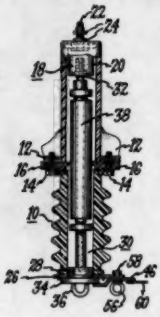


A connector socket of the integrated wire termination system (IWTS) type adapted to receive any one of a plurality of different types of "standard" terminal (connector) pins, having tips of different lengths, inserted therein by a split-sleeve tool. The socket includes an integral retainer formed thereon for engaging the annular shoulder of the terminal pin to lock it in electrically conducting relation therewithin. This integral retainer is a split spring sleeve that has been sheared to provide a generally U-shaped cut across the split. The socket has an aperture in one side. This split sleeve is placed around the apertured section, and the split and sheared side is formed into such aperture to form a catch for engaging the annular shoulder of the terminal pin. Insertion of a split-sleeve release tool from the rear allows release of the terminal pin for disconnection.

3,721,946
HIGH VOLTAGE BUSHING WITH REMOVABLE CONNECTOR AND LOCKING PLATE

Henry Hucko and Henry T. Lusignan, Pittsfield, Mass., assignors to General Electric Company

Filed Dec. 2, 1971, Ser. No. 204,095
Int. Cl. H01r 13/54
U.S. Cl. 339—75 R 7 Claims

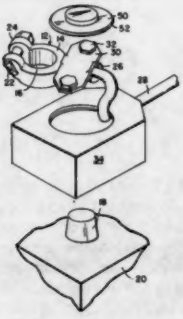


A high voltage bushing for electrical apparatus such as a transformer. The bushing is hollow and has provisions for receiving either a fuse connector or a solid connector. A locking plate is provided which mounts on the terminal plate of the bushing and engages the connector, preventing withdrawal of such connector while the locking plate is attached to the terminal plate.

3,721,947
BATTERY TERMINAL GUARD

Edward L. Robin, 115 Glacier Circle, Vacaville, Calif.

Filed July 13, 1972, Ser. No. 271,632
Int. Cl. H01r 11/26
U.S. Cl. 339—116 R 5 Claims

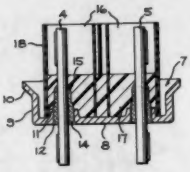


A protective device for preventing the corrosion or sulfation of a cable connector on the battery terminal includes a flexible casing that fits snugly around the connector and the base of the terminal and an upper opening forming the seat for a rigid, circular top cover element that gives the casing an air tight seal when installed in the casing.

3,721,948
TERMINAL ASSEMBLY

George W. Brandt, and Joe T. Hague, both of Tyler, Tex., assignors to General Electric Company, Louisville, Ky.

Filed March 2, 1972, Ser. No. 231,179
Int. Cl. H01b 17/26
U.S. Cl. 339—176 R 6 Claims

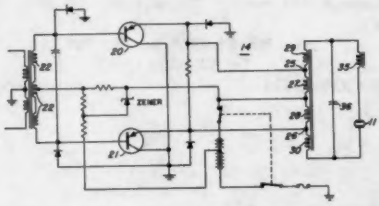


An electric terminal assembly, particularly for heremetic compressors, comprising a plurality of conductor pins extending through a metal body member and secured thereto by glass-to-metal seals is provided with sleeves of insulating material surrounding the pins and a body of resinous material anchoring the sleeves to the body member and covering the glass seals.

3,721,949
ECHO REPEATER TARGET

William C. Hubbard, Lemon Grove; Keith E. Geren, and Warren A. Sauer, both of San Diego, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy

Filed Sept. 30, 1964, Ser. No. 400,608
Int. Cl. H04b 11/00
U.S. Cl. 340—3 E 3 Claims



1. In combination in a system for driving a transducer with a predetermined capacity between terminals;

an amplifier;

a source of a relatively broad bond of frequencies for driving said amplifier;

an inductance with terminals connected across the output of said amplifier;

the impedance between said terminals being matched to the output impedance of said amplifier for the optimum transfer of power;

a parallel tuned circuit comprising a first tuning element coupled across said inductance to parallel tune said inductance to any frequency F within said band;

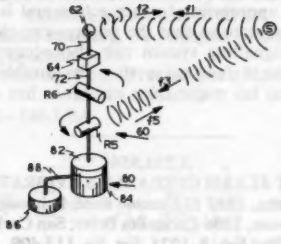
a series tuned circuit comprising a tuning element connected in series with said transducer, said element being of predetermined reactance to series tune said transducer to said frequency F;

said series tuned circuit being coupled across said parallel tuned circuit so that the sign of the reactances of the series and the parallel circuits vary complementarily at frequencies above and below said frequency F.

3,721,950
RESPONSIVE NAVIGATION BEACON

Stig. W. Jorgensen, Hollis, N.H., and Wayne A. Kearsley, Chelmsford, Mass., assignors to Sanders Associates, Inc., Nashua, N.H.

Filed Aug. 13, 1969, Ser. No. 866,406
Int. Cl. G01s 3/00
U.S. Cl. 340—3 E 4 Claims

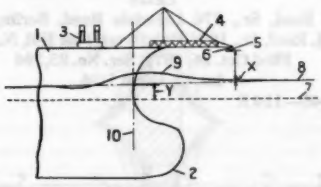


A navigation beacon is provided which does not emit a continuous signal. Instead, it has a pair of responsive devices rotating at different angular velocities related in the ratio 2:1. The responsive devices may be either passive reflectors or active transponders, and the signal may be subsonic, sonic, or supersonic acoustic energy, or infrared, visible, ultraviolet or microwave radiation or combinations of any of these forms of energy. In any case, an observer having any bearing relative to the beacon will receive two distinct responses from the pair of reflectors or transponders. The time interval between these two responses will be a calculable function of that bearing. In addition, the interval between interrogation and response will be a calculable function of the observer's range from the beacon. Various refinements may be added to make the beacon easier to locate for friendly forces, or to make it difficult for enemy forces to locate. The beacon can even be turned off entirely except when activated by a predetermined command and the command can be in coded form to prevent activation by an enemy.

3,721,951
NAVIGATIONAL INSTRUMENTS FOR SHIPS

Archibald McIntyre Ferguson, Cardross, Scotland, assignor to The University Court of the University of Glasgow, Glasgow, Scotland

Filed Sept. 9, 1970, Ser. No. 70,828
Claims priority, application Great Britain, Sept. 16, 1969, 45,475/69
Int. Cl. G01s 9/66
U.S. Cl. 340—3 13 Claims

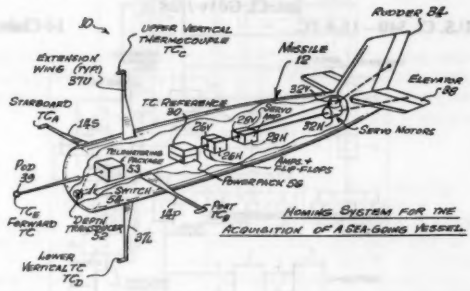


A navigational instrument for a ship incorporates an echo device arranged to measure the distance from a fixed part of the ship to the surface of the water at a point in advance of the ship. It includes a clinometer device arranged to measure the angle of fore and aft inclination of the ship from its static position and feed a corresponding signal to a computer together with the signal from the echo device. Indicating means receive the output from the computer which is in the form of an indication of the amount of the depression of the selected part of the ship and show such indication as a visual signal. The instrument may also incorporate a hog and sag clinometer providing a measure of any hog and sag present in the ship the output of said clinometer being also fed to the computer for correction of the output signal. The instrument may also incorporate means for feeding to the computer a signal which indicates the speed of the ship.

3,721,952
HOMING SYSTEM FOR THE ACQUISITION OF A SEA-GOING TARGET VEHICLE BY DETECTION OF ITS WAKE

Joseph P. Strapp, 1840 Deserta Drive, Glendora, Calif.

Filed April 29, 1971, Ser. No. 138,538
Int. Cl. F42b 19/01
U.S. Cl. 340—4 R 9 Claims

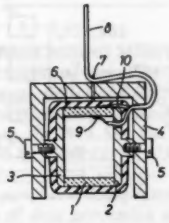


An underwater missile homing system, comprising: two pairs of test thermocouple (TC) junctions, means for mounting one pair of TC junctions on the missile so that they extend laterally therefrom in opposite directions, and means for mounting the other pair of TC junstions on the missile so that they extend vertically therefrom in opposite directions. Guidance means are provided on the missile for guiding the missile in a horizontal direction and in a vertical direction. Means are also provided responsive to signals obtained from the TC junctions for controlling the guidance means, whereby said missile will home in on a sea-going vehicle, in azimuth and elevation, which emits heat in its wake.

3,721,953
IMPROVEMENTS RELATING TO HYDROPHONES

Derek J. Bennett, Bedford, Nova Scotia, Canada, assignor to EMI Limited, Middlesex, England

Filed April 22, 1970, Ser. No. 30,924
Claims priority, application Great Britain, April 22, 1969, 20,373/69
Int. Cl. H04r 17/00
U.S. Cl. 340—8 S 3 Claims



A hydrophone adapted to be suspended underwater by means of a cable, which preferably carries electrical leads as

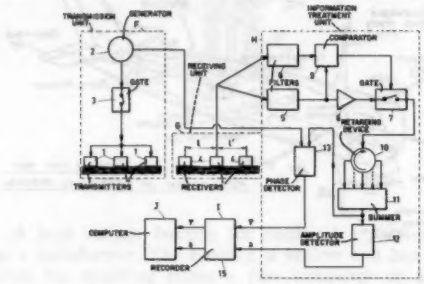
cores thereof, includes a transducer element having substantially axial symmetry. The element is secured in a yoke by means of mountings positioned on the axis of symmetry, and the electrical leads for deriving output signals from the element are connected to respective points on the transducer so that the effects of vibrations transmitted along the cable to the element tend to be self-cancelling.

3,721,954

METHOD FOR SURFACES EXPLORATION ADAPTED IN PARTICULAR TO SEISMIC PROSPECTING AND DEVICE THEREFOR

Andre Fontanel, 92 Asnieres (Hauts de Seine), and Gerard Grau, Paris XVII eme, both of France, assignors to Institut Francais du Petrole des Carburants et Lubrifiants, Ruell Malmaison, France

Filed May 14, 1970, Ser. No. 37,146
Claims priority, application France, May 14, 1969, 6915820
Int. Cl. G01v *1/28*
U.S. Cl. 340—15.5 TC **14 Claims**



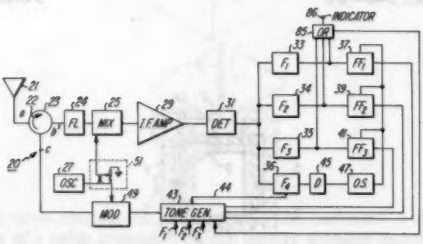
Method for exploration of surfaces in a surveyed zone, particularly discontinuities of the subsurface strata which comprises transmitting acoustic or radio wave trains at a substantially constant frequency from at least one point during a time interval at least equal to the travel time of the waves over twice the distance between two limit points of said surveyed zone, receiving and recording the waves reflected and diffracted from said discontinuities during at least half a period of the transmitted wave train, determining one number representative of the amplitude and one number representative of the phase from each recording and using said two numbers from each recording to restore the surface or discontinuities of the surveyed zone.

3,721,955

DISABLED VEHICLE SIGNALLING SYSTEM

Leonard Norman Schiff, Trenton, and Harold Staras, Princeton, N.J., assignors to RCA Corporation

Filed July 15, 1971, Ser. No. 162,857
Int. Cl. G08g *1/09*
U.S. Cl. 340—33 **4 Claims**



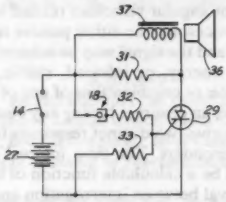
A system is described which will allow disabled motorists to signal for help directly from the disabled vehicle by the use of suitably equipped passing vehicles on limited access highways. The suitably equipped vehicles receive the distress message from a disabled vehicle and store that message until the vehicle reaches an interrogator unit located, for example, near an exit of the highway. The interrogator unit acts both as a transmitter and a receiver. When a passing vehicle bearing a distress message receives the interrogation signal, it transmits the distress message to the receiver portion of the interrogation unit for appropriate further action and is itself reset to the original state so that the process can start all over again. This signalling system can also accommodate an acknowledgement feature so that the disabled motorist will know that his request for assistance has entered the system.

3,721,956

THEFT ALARM OPERABLE BY VIBRATION

Victoria Hamann, 1032 El Camino Real, Belmont, Calif., and Jack C. Dawson, 2206 Carmelita Drive, San Carlos, Calif.

Filed Feb. 8, 1971, Ser. No. 113,409
Int. Cl. B60r *25/10*
U.S. Cl. 340—65 **1 Claim**



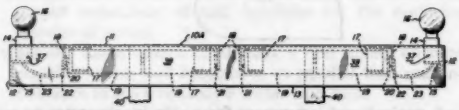
An alarm is attached to a device such as a bicycle and operates when the device is moved. The alarm is controlled by a key switch which is turned on when the device is left unattended and must be turned off to de-energize the alarm. Within a casing is a vibration switch consisting of a weight on a flexible wire contained within a tube. Vibration and/or displacement from rest position causes the weight to establish momentary electric contact with the tube. The electric circuit contains a latching element such as a silicon controlled rectifier, the gate of which is connected to the vibration switch. With the key switch on, moving the device causes the weight to contact the tube, latching the rectifier on, and causing the buzzer to sound until the key switch is turned off.

3,721,957

FLASHING TOY ROAD BARRIER HAVING FOLDING LEGS

Frank J. Reed, Sr., 276 Lakedale Road, Berlin, N.J., and Frank J. Reed, Jr., 1006 Pine Street, Pine Hill, N.J.

Filed Oct. 26, 1970, Ser. No. 83,794
Int. Cl. G08b *5/36*
U.S. Cl. 340—114 R **11 Claims**



A toy road barrier or marker having a channeled crossmember or body providing a recess or trough which contains a lamp socket bracketed and grounded to an interior surface and extending through an opening in one wall to receive an external flashing-type battery lamp. The trough also contains a

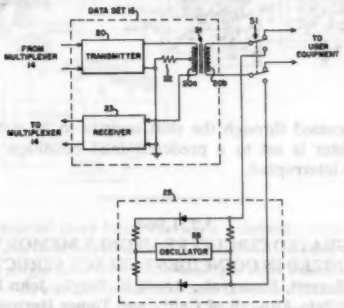
pair of battery mounting clips and two small flashlight battery cells mounted therein. The latter are connected with the socket and lamp through ground and an insulated lead extending from the lamp socket. Supporting legs for the body, pivoted in pairs in the end walls, swing together for storage or outwardly for a spaced four-point footing.

3,721,958

TESTING ARRANGEMENT FOR A DATA COMMUNICATION SYSTEM

Robert P. Dixon, Rustburg, Va., assignor to General Electric Company, Lynchburg, Va.

Filed April 30, 1971, Ser. No. 138,999
Int. Cl. G08c *25/02*
U.S. Cl. 340—146.1 BA **3 Claims**



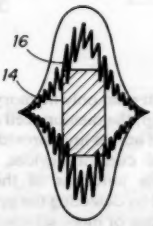
The operation of a data communication system having a central transmitter and receiver and a data set transmitter and receiver, usually remotely positioned, can be tested by connecting a frequency converter between the data-set transmitter output and the data set receiver input so that signals from the central transmitter to the data set transmitter are returned by the data set receiver back to the central receiver. The data transmitted by the central transmitter can be compared with the data received by the central receiver to provide an indication of the operation of the data communication system.

3,721,959

METHOD AND MEANS FOR DETECTING ERROR RATE OF TRANSMITTED DATA

Robert A. George, Richardson, Tex., assignor to Collins Radio Company, Dallas, Tex.

Filed Nov. 29, 1971, Ser. No. 202,958
Int. Cl. H04b *3/46*; H03k *5/18*; G08c *25/00*
U.S. Cl. 340—146.1 AX **9 Claims**



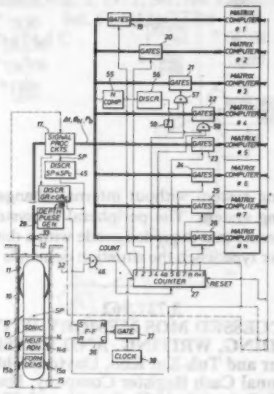
Method and means of error rate detection including developing an eye pattern analog signal of transmitted digital data, defining a region within said eye pattern as an unacceptable area through which said eye pattern may not transgress, and counting as an erroneous signal each transgression of said analog signal into said region.

3,721,960

METHODS AND APPARATUS FOR PROCESSING WELL LOGGING DATA

David H. Tinch, New Orleans, La., Raymond L. Campbell, Jr., Garches, France, Elie S. Eliahou, Danbury, Conn., and Arthur W. Schmidt, Houston, Tex., assignors to Schlumberger Technology Corporation, New York, N.Y.

Filed July 14, 1969, Ser. No. 841,527
Int. Cl. E21b *49/00*
U.S. Cl. 73—152 **25 Claims**



In accordance with illustrative embodiments of the present invention, the parameters present in any formation can be determined and their percentages computed. To accomplish this, measurements of the acoustic travel time, hydrogen index, and bulk of a formation are obtained and used in a four-by-four matrix to determine the percentages of four formation parameters in a given formation. Since there are a great many possible formation parameters, these formation parameters are arranged in matrix sets where each matrix set can have any possible combination of four parameters. These matrix sets are ordered in accordance with their probability of occurrence in a given formation. The percent of the formation bulk volume contributed by each parameter in the first ordered set is computed and these computations tested for feasibility. If not feasible, the second most probable set is considered. This process continues until feasible computations are obtained whereupon the computations are recorded and the next formation depth level is considered. As an aid in determining the probability of occurrence and thus the order with which the sets are considered, measurements of one or more formation characteristics, including computations made from one or more derived measurements, can be used.

3,721,961

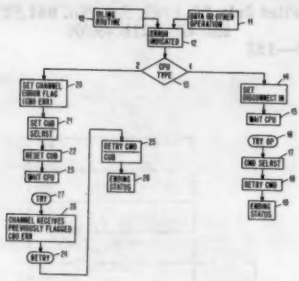
DATA PROCESSING SUBSYSTEMS

Gene H. Edstrom, Longmont; Russell M. Elwell, Boulder, and John W. Irwin, Langmont, all of Colo., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Aug. 11, 1971, Ser. No. 170,859
Int. Cl. G06f *11/04, 15/16*
U.S. Cl. 340—172.5 **13 Claims**

Data processing peripheral subsystems are connectable to two different types of data processing systems, each having different capabilities. For example, one data processing system Type 1 has certain error recovery procedures which are greater and more effective than those available for Type 2.

The peripheral subsystem detects the type of data processing system to which it is attached and adjusts its operational procedures for emulating the operation of a Type 2 data processing system to the operational capabilities of the Type 1



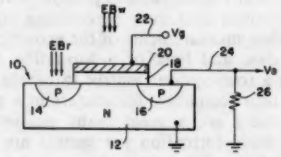
data processing system without internal changes within the data processing system. The peripheral subsystem is further adapted to operate in a degraded mode with a data processing system of either type when the situation demands it.

3,721,962

BEAM ACCESSED MOS MEMORY WITH BEAM READING, WRITING, AND ERASING

John E. Foster and Tuh-Kai Koo, Dayton, Ohio, assignors to The National Cash Register Company, Dayton, Ohio

Filed Aug. 3, 1970, Ser. No. 60,572
Int. Cl. G11c *7/00, 11/40, 11/26*
U.S. Cl. 340—173 CR **24 Claims**



There is described a beam accessed metal oxide semiconductor memory into which binary information can be written and stored and from which that information can be read or erased. The writing, reading, or erasing is accomplished by causing an electron beam of either a high or a low intensity to scan across the gate or drain electrodes of the memory elements while simultaneously applying either a read, a write, or an erase voltage to the gate electrode thereof. There is also described means for controlling the beam position in a self-clocking manner. This is accomplished by providing metal indexing strips along the path which the beam travels and then counting the pulses created in the strips as the beam scans thereacross.

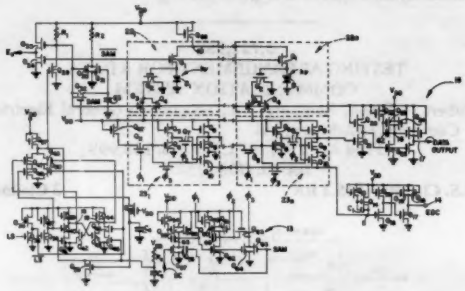
3,721,963

PHOTON TO DIGITAL CONVERTER USING PHOTON FLUX INTEGRATION

Fredrick B. Jenne, Huntington Beach, Calif., assignor to North American Rockwell Corporation, El Segundo, Calif.

Filed March 13, 1972, Ser. No. 234,050
Int. Cl. G11c *13/04*
U.S. Cl. 340—173 LM **10 Claims**

Output voltage levels on precharged photo-diodes receiving light inputs are sampled after a period of time sufficient to permit photon flux integration. The sampled voltage levels are converted into digital signals representing digital data of either a true or false logic state. The data signals are stored in a multibit shift register until called for or until the next sampling interval. When all the data represented by the light inputs have



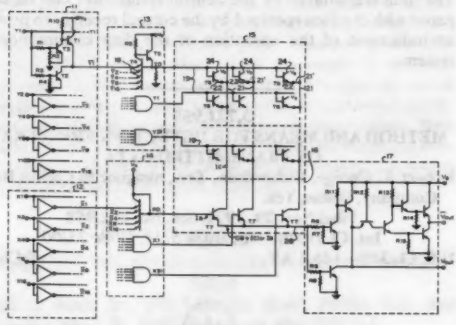
been processed through the shift register to an output, the shift register is set to a predetermined condition and the process is interrupted.

3,721,964

INTEGRATED CIRCUIT READ ONLY MEMORY BIT ORGANIZED IN COINCIDENT SELECT STRUCTURE

John C. Barrett, Sunnyvale; Arndt B. Bergh; John E. Price, both of Palo Alto, all of Calif., and Tomas Hornak, United Kingdom, assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Feb. 18, 1970, Ser. No. 12,262
Int. Cl. G11c *7/00, 11/40, 17/00*
U.S. Cl. 340—173 SP **7 Claims**

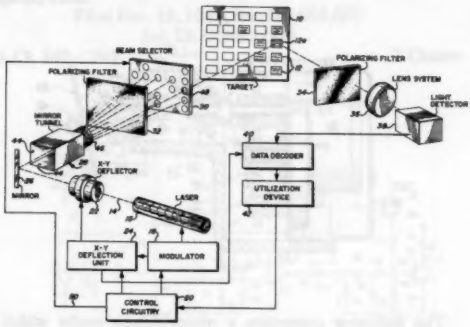


An integrated circuit read only memory fabricated on a single semiconductor chip, the memory cell array being arranged with orthogonal sets of access lines providing coincident selection of unidirectional current devices, for example, base-emitter diodes, at the junctions of the access lines. The memory cells are read by detecting the presence or absence of current flow through one or more selected cells. One set of access lines is formed by base diffusion stripes spaced apart in a common-collector isolation well. The orthogonal set of access lines is formed by metal lines overlying the base stripes and the individual emitters diffused in the base stripes at the points of intersection with the metal lines. Programming of the bit pattern is accomplished by contacts between the emitters and the metal lines at selected cross-over points. An improved inverter circuit is provided in the memory array access circuitry.

3,721,965
APPARATUS FOR FORMING A MULTIPLE IMAGE LASER OPTICAL MEMORY

Albert M. Morgan-Voyce, Oklahoma City, Okla., assignor to Honeywell Information Systems Inc., Phoenix, Ariz.

Filed Nov. 22, 1971, Ser. No. 201,600
Int. Cl. G11c *11/14*
U.S. Cl. 340—174 YC 6 Claims

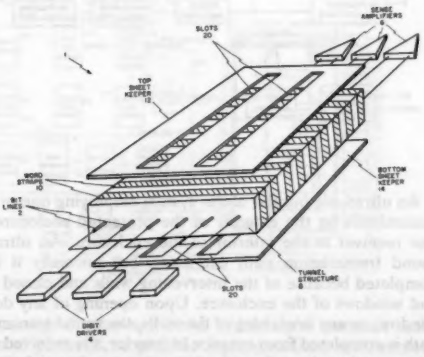


A modulated laser beam having a uniplanar, two direction deflection is directed to a mirror tunnel. The mirror tunnel divides the single laser beam into multiple laser beams. The multiple laser beams are polarized and a beam selector permits only one raster scan from the multiple images of the mirror tunnel to reach the memory film target. The Curie-point recording method forms the information onto the film. For reading information from the target, the laser beam is deflected, multiplied and selected as for writing. Reflected light from a spot on the target exhibits a clockwise or counter-clockwise change in the polarization angle depending on the binary state of the magnetic field. The Kerr-effect polarization change is passed through a polarization filter which permits one state of the magnetic field to be passed and blocks the second state of the magnetic field. The light passing through the polarizing filter is collected by a lens and detected by a light detector such as a photocell. The output of the light detector is directed to a utilization device for use therein.

3,721,966
PLATED WIRE STACK WITH MINIMIZED INTER-BIT COUPLING

Joseph P. McNamara, 51 Ft. Meadow Dr., Hudson, and Thomas G. Bair, 32 Juniper Brook Rd., Northborough, both of Mass.

Filed Oct. 20, 1971, Ser. No. 190,841
Int. Cl. G11c *5/02, 11/04, 11/14*
U.S. Cl. 340—174 BC 1 Claim

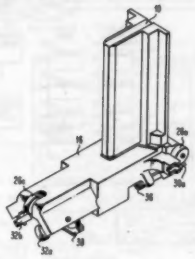


A plated wire memory stack includes parallel bit lines and a plurality of conductors perpendicular to the bit lines for carrying "word" currents. Permalloy "keeper" layers used to shape the word drive fields have a plurality of slots therein which are parallel to the bit lines to minimize inter-bit coupling.

3,721,967
HEAD CARRIAGE ASSEMBLY FOR MAGNETIC DISK STORAGE DRIVE

Ralph A. Englert, Monte Sereno, Ronald F. Fasano, Los Gatos, and Darrell D. Palmer, San Jose, all of Calif., assignors to International Business Machine Corporation, Armonk, N.Y.

Filed Aug. 2, 1971, Ser. No. 168,238
Int. Cl. G11b *21/08*
U.S. Cl. 340—174.1 C 7 Claims

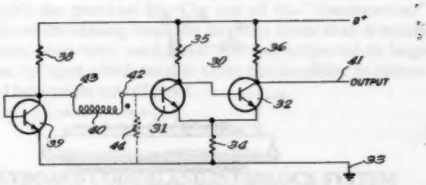


A carriage assembly useful with a head accessing mechanism in a magnetic disk storage system includes a base having parallel guide rails disposed in a triangular type configuration. The rails cooperate with a carriage body having a first set of bearings for riding on the top surface of the guide rails, and additional angled bearings that engage corresponding angled portions of the guide rails inboard of the periphery of the base. At least one of the angled bearings is spring loaded. The configuration is symmetrical about a vertical plane that is coincident with the direction of the axis along which the accessing mechanism travels.

3,721,968
MAGNETIC PICKUP

Gordon E. Gee, Deerfield, Ill., assignor to Electro Corporation, Sarasota, Fla.

Continuation of Ser. No. 875,983, Nov. 12, 1969, abandoned.
This application Feb. 2, 1972, Ser. No. 222,735
Int. Cl. G08b *21/00*
U.S. Cl. 340—195 8 Claims

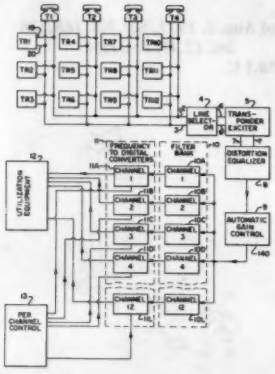


A magnetic pickup having an electronic switch circuit incorporated in the sensing unit to generate a high level digital signal, improving the signal form and the signal-to-noise ratio. The switch has an input transistor with a base bias circuit including a diode having a characteristic comparable with that of the base emitter junction of the input transistor, to stabilize the bias and the sensitivity of the switch. In one form of the invention, the emitter coupling element of the transistorized switching circuit has a constant voltage independent of the supply potential, enabling the use of one circuit over a range of operating voltages.

3,721,969
DATA COMMINICATING SYSTEM HAVING MEANS FOR SENSING DIFFERENCE BETWEEN REFERENCE AND DATA SIGNALS

Victor E. Stewart, Jr., South Milwaukee, Wis., assignor to McGraw-Edison Company, South Milwaukee, Wis.

Filed Feb. 22, 1971, Ser. No. 117,293
Int. Cl. G08c 19/16
U.S. Cl. 340—207 8 Claims

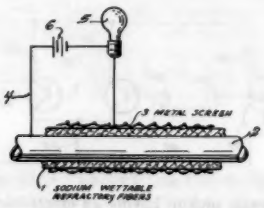


A data gathering system, particularly adapted for communicating of meter reading data over telephone lines, comprising data reading means, encoding means and coded data transmitting transponder means located at a remote location such as a subscriber's home; and centrally located control means, transponder exciting means, decoding means, and utilization means. The system has a data transmission scheme using an extended baud, multilevel frequency signal system wherein values are represented by frequency differences relative to a reference frequency and the decoding apparatus adjusts in response to the reference frequency signal to compensate for transponder variations or long term drift.

3,721,970
ALKALI METAL LEAK DETECTOR

Hubert R. Niemoth, Elmhurst, Ill., assignor to the United States of America as represented by the United States Atomic Energy Commission

Filed Oct. 6, 1971, Ser. No. 187,043
Int. Cl. G08b 21/00
U.S. Cl. 340—242 7 Claims

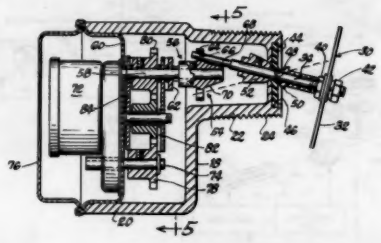


A layer of refractory fiber insulation such as a felt sheet consisting essentially of aluminum silicate fibers is placed between two layers of conducting material, such as steel screens which are connected in an electrical circuit to a detecting device, such as an electric light. This device is a leak detector in which a drop of liquid sodium, potassium or other alkali metal will short out the screens and give a signal on the detecting device.

3,721,971
MATERIAL LEVEL INDICATOR FOR BINS OR OTHER RECEPTACLES

George E. Gruber, Port Sanilac, Mich., assignor to Monitor Mfg., Inc., Minden City, Mich.

Filed March 22, 1971, Ser. No. 126,446
Int. Cl. G08b 23/00
U.S. Cl. 340—246 10 Claims

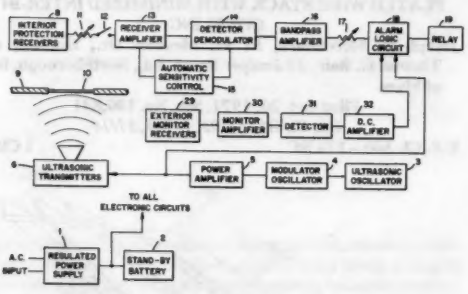


The indicator comprises a motor-driven probe which is oscillated or otherwise moved relative to the material in a bin or other receptacle. The motor rotates a first gear, while the probe is operated by a mechanism driven by a second gear. An intermediate gear meshes with the first and second gears and is mounted on a swingable carriage pivoted about the axis of one of the other gears. When the probe engages the rising material, the movement of the probe is impeded. The resulting torque reaction causes swinging movement of the carriage against the biasing force of a spring. The carriage thereby operates a switch which can be employed to actuate an alarm, stop the motor, stop the flow of material into the bin, or perform other control functions. The probe is swingably supported by a flexible diaphragm which also acts as a seal.

3,721,972
ULTRASONIC BURGLAR ALARM SYSTEM

Albert L. Hermans, c/o Seabord Electric, 2255 Bancroft Ave., San Leandro, Calif.

Filed Feb. 22, 1972, Ser. No. 228,138
Int. Cl. G08b 13/16
U.S. Cl. 340—276 10 Claims



An ultrasonic burglar alarm system employing one or more transmitters on the exterior of the protected enclosure, and one receiver in the interior of the enclosure. An ultrasonic sound transmission path can exist, but normally it is not completed because of the intervening walls and closed doors and windows of the enclosure. Upon opening of any door or window, or any breaching of the walls, the sound transmission path is completed from exterior to interior, the received sound is detected, and an alarm is given. A supervisory circuit em-

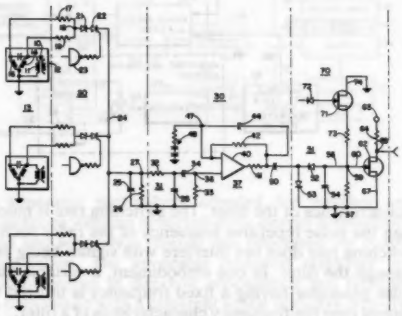
ploying exterior receivers is also used, so that if an attempt is made to muffle any exterior transmitter or impair any exterior receiver, an alarm is given.

3,721,973

SPEED MONITORING APPARATUS

Garald C. Sundbert, Huron, S. Dak., and Eugene T. Swenson, Minneapolis, Minn., assignors to Honeywell, Inc., Minneapolis, Minn.

Filed Dec. 15, 1969, Ser. No. 885,032
Int. Cl. G08b *21/00*
U.S. Cl. 340—263 **7 Claims**



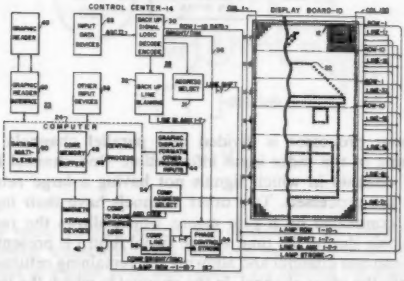
The arrangement provides a novel method of selectively monitoring the hunt frequency of the synchronous spin motors of several gyros to determine the proper operation of the selected gyro. Two signals are used from each gyro for such monitoring action: (1) the phased winding voltage, and (2) the spin motor excitation voltage, of the split phase or two phase motor that drives the gyro rotor. Summing of the phased winding voltage and the excitation voltage for the line winding produces an amplitude modulated carrier wave, modulated proportional to the hunt phase shift of the rotor. The resultant modulation envelope is detected, filtered, band pass amplified and thereafter converted to a threshold logic voltage for an indication that the gyro spin motors are at synchronous speed.

3,721,974

MESSAGE DISPLAY SYSTEM AND PICTORIAL PROGRAMMER THEREFOR

Richard M. Jenifer, Chicago, Robert A. Payne, Des Plaines, and Frank L. Sobchak, Chicago, Ill., assignors to Stewart-Warner Corporation, Chicago, Ill.

Filed May 13, 1971, Ser. No. 143,023
Int. Cl. G09f *9/32*
U.S. Cl. 340—339 **2 Claims**



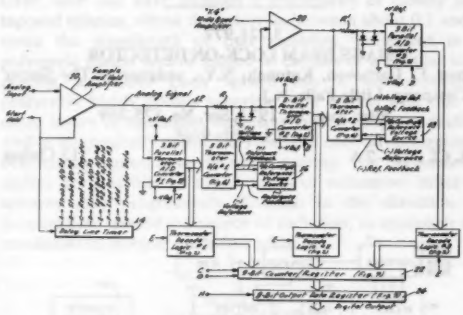
A message display system in which alpha numeric messages and pictorial or graphic representations are formed. A display board formed of a matrix of display elements such as lamps is controlled by means of digital signals. While the alpha numeric messages are read into the system by well known input means, the pictorial representations are formed by a unique device which optically views a drawing or printed picture and creates digital signals which are processed to display the drawing or printed picture on the display board or stored for subsequent display.

3,721,975

HIGH SPEED ANALOG-TO-DIGITAL CONVERTER

John D. Brinkman, Pine Brook; Ronald Y. Paradise, Hillsdale, and Robert S. Prill, Parsippany, all of N.J., assignors to The Singer Company, Little Falls, N.J.

Filed Oct. 7, 1971, Ser. No. 187,247
Int. Cl. H03k *13/02*
U.S. Cl. 340—347 AD **6 Claims**



An analog-to-digital converter is provided which is capable of high speed operation in the nanosecond range. The analog input is introduced to an N-bit analog/digital converter; and the resulting digital output is passed to a digital/analog converter, the output of which appears across a current summing resistor stage. The aforesaid components make up a universal stage which can be cascaded with other similar stages through appropriate scaling amplifiers to provide a high resolution high speed analog-to-digital converter. The aforesaid universal stage uses a "thermometer" code in its analog/digital and digital/analog converters, such that each leg of the digital/analog converter has a weight of one count only. This is in contradistinction to the binary code in which each higher order bit has a weight of twice the number of counts, as compared with the previous bit. The use of the "thermometer" code allows the scaling amplifier to settle faster than it would if a binary code were used, since it is not subjected to large transient voltages which tend to drive the amplifier to saturation and beyond its cut off point.

3,721,976

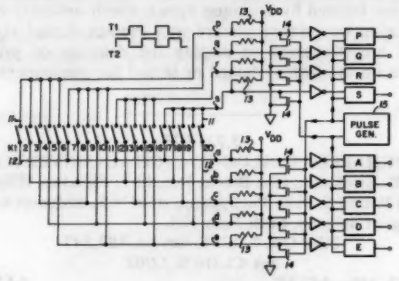
KEYBOARD CODING AND INTERLOCK SYSTEM

Han Kuijsten, Alameda County, Calif., assignor to Omron Systems, Inc., Mount View, Calif.

Filed Feb. 1, 1971, Ser. No. 111,363
Int. Cl. H04q *3/00*
U.S. Cl. 340—365 S **7 Claims**

A keyboard coding and interlock system wherein the key switches are single contact, two terminal switches coupled to two sides of a logic circuit matrix with substantially fewer input lines than the number of key switches. Pulse means are provided for alternately sampling the input lines on each side

of the matrix to determine the condition of the key switches and storage means are provided for producing a binary output



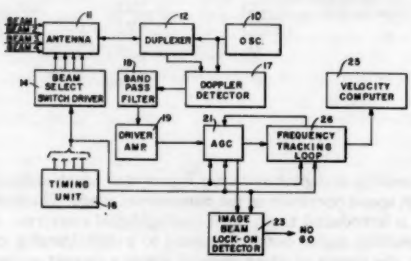
indicating the open-closed condition of the switches. A decoding matrix fully decodes the output of the encoding logic matrix.

3,721,977

IMAGE BEAM LOCK-ON DETECTOR

Ernest F. Darboven, Katonah, N.Y., assignor to The Singer Company, Little Falls, N.J.

Filed Aug. 26, 1971, Ser. No. 175,269
Int. Cl. G01s 9/48
U.S. Cl. 343—7 A **13 Claims**



In an airborne doppler velocity sensor employing a fixed antenna with selectable multiple beams, a system is provided for detecting when a frequency tracking loop has locked onto signals from an unsuppressed image beam corresponding to a non-selected beam. An automatic gain control (AGC) signal is provided representative of the relative power levels of frequency signals in each beam tracked by the loop. The AGC signal is continuously fed to a module which maintains a reference voltage at a value indicative of the maximum power being received from all of the beams. If the difference between the reference voltage and a signal representing the minimum value of the AGC signal exceeds a threshold set by a comparator, a "no-go" signal is produced warning that the tracking loop has locked onto a spurious signal and velocity computations are therefore unreliable.

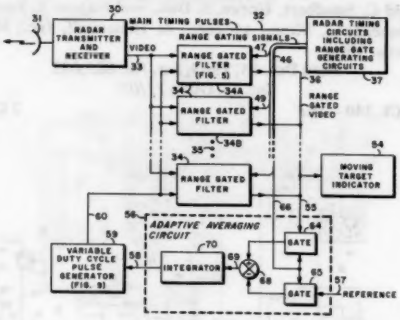
3,721,978

ADAPTIVE RADAR CLUTTER REJECTION

John G. Doggett, Jr., Scottsdale, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Nov. 19, 1968, Ser. No. 776,908
Int. Cl. G01s 9/42
U.S. Cl. 343—7 A **7 Claims**

A control loop in a radar receiver is jointly responsive to range gated video and a reference potential to establish a filter control signal. A plurality of range gated filters are responsive to the filter control signal to adjust the frequency response in a manner such that clutter is rejected yet the maximum frequency bandwidth is dynamically provided for moving target detection for varying clutter conditions. Each range gated filter has a filter element which is switchable such that the effective electrical properties of the element vary in accordance with the switching to thereby effect a change in the frequency



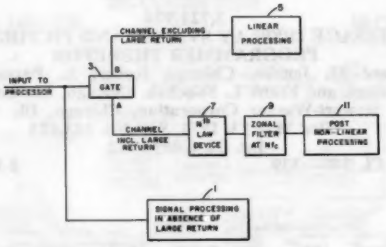
characteristics of the filter. The switching rate is much higher than the pulse repetitive frequency of the radar such that the switching rate does not interfere with signals being processed through the filter. In one embodiment, a variable duty cycle pulse generator having a fixed frequency is utilized to effect control over the frequency characteristics of a filter.

3,721,979

DETECTION IN A MULTIPLE-TARGET ENVIRONMENT

Hugh W. Gouldthorpe, Cazenovia, N.Y., assignor to the United States of America as represented by the Secretary of the Army

Filed Sept. 10, 1971, Ser. No. 179,381
Int. Cl. G01s 9/02
U.S. Cl. 343—7 A **2 Claims**

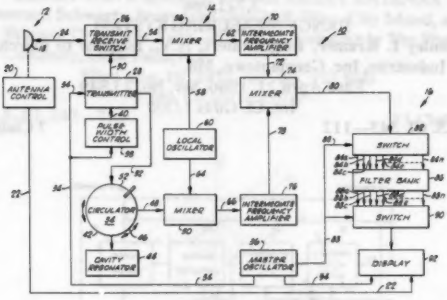


A radar processor is divided into parallel channels for processing of the radar input information. One channel is a regular channel in which signals not having a large return therein are processed. Two other channels have their input therein controlled by a gate means which allows the radar returns only during the time a large signal return is present to be fed into one channel and allowing the remaining returns to enter into the other channel. In the channel in which the large signal return is allowed to be processed, an Nth law device and a zonal filter provide for enhancement of small returns which are included along with the large return. In this way the small returns can also be processed.

3,721,980
GATED RANGE SEARCH RADAR

George K. Oister, 1109 Southeast 11th Street, Edmond, Okla.

Filed Sept. 23, 1971, Ser. No. 183,083
Int. Cl. G01s 9/44
U.S. Cl. 343—9 11 Claims

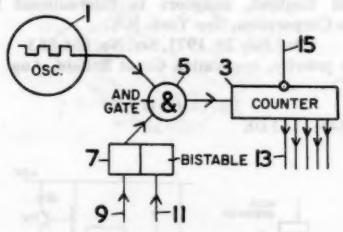


Radar apparatus particularly adapted for weather and search operations wherein reflected pulse energy is effectively time gated and separately filtered and processed for output display indication. The apparatus transmits relatively low power output energy in directive propagation and reflected energy is then mixed with a coherent signal to derive time-displaced doppler frequency electrical signals representative of energy returned. The time-displaced doppler frequency signals are then processed as resolution cells lying within a predetermined different energy time-displacement range, and doppler energy from each resolution cell is processed separately through characteristic filtering networks which provide individual data output for display in accordance with coordinates or parameters as derived from antenna scan information and energy travel times for the plurality of resolution cells.

3,721,981
PULSE RADAR RANGING

Robert Allard, and John Lawton Clarke, both of Malvern, England, assignors to Minister of Aviation Supply in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Nov. 17, 1970, Ser. No. 90,394
Claims priority, application Great Britain, Nov. 19, 1969, 56,555/69
Int. Cl. G01s 9/12
U.S. Cl. 343—13 R 6 Claims

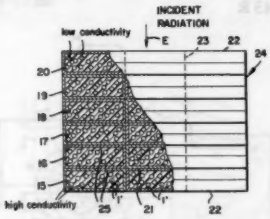


A radar ranging system for calculating the time interval between transmitted and received pulses or vice versa by means of a pulse generator, means for causing the transmitter to transmit a pulse at a time which is random compared with the pulse generator output, means for admitting pulses from the pulse generator to a counter for a plurality *m* of time intervals and means for dividing the output of the counter by *m*.

3,721,982
ABSORBER FOR ELECTROMAGNETIC RADIATION

Ludwig Wesch, Heidelberg, Germany, assignor to Fa. Grunzweig & Hartman AG., Ludwigshafen am Rhine, Germany

Filed Nov. 10, 1970, Ser. No. 88,425
Int. Cl. H01q 17/00
U.S. Cl. 343—18 A 12 Claims

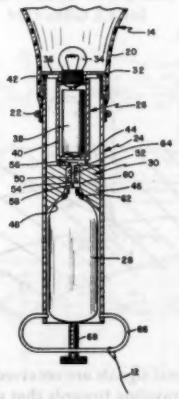


A body designed to absorb electromagnetic radiation in the UHF, SHF and EHF includes a multiplicity of closely juxtaposed spheres, whose diameters lie between about 0.1 and 5 times the wavelength of that radiation, imbedded in a polymeric matrix and/or lodged in cavities of a cellular supporting structure. Each sphere has a nonconductive, preferably highly porous spherical core coated with one or more layers of radiation-responsive (electrically conductive and/or magnetically permeable) material each advantageously overlain by a protective dielectric coating. The conductivity and/or permeability of the coatings of successive strata of spheres may progressively diminish in the direction of propagation, toward the source of radiation, to approach the conditions of ambient air or free space.

3,721,983
SIGNAL BALLOON

Osborn Sherer, Box 134, Stratham, N.H.

Filed June 8, 1970, Ser. No. 44,153
Int. Cl. G01s 9/02; G01w 1/08
U.S. Cl. 343—18 B 2 Claims

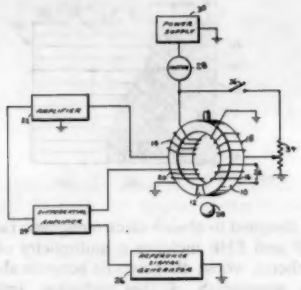


A signal balloon is provided for use by hunters, boatsmen and the like to attract searchers when the hunter or boatsman is lost or in distress. A brightly colored translucent balloon containing radar reflective material is attached to a cannister containing a battery and bulb for illuminating the balloon from inside and is formed with a charging chamber to receive a cylinder of helium and operating through a valve by which the balloon may be inflated. A line is attached to the casing for holding or anchoring inflated balloon.

3,721,984
MAGNETOMETER EMPLOYING MAGNETICALLY SUSPENDED BODY

Jorge G. Codina, Hartsdale, N.Y., assignor to Gravimetrics Incorporated, Washington, D.C.

Continuation of Ser. No. 831,280, June 5, 1969, abandoned.
This application July 12, 1971, Ser. No. 161,894
Int. Cl. G01r 33/02
U.S. Cl. 324—43 R 10 Claims

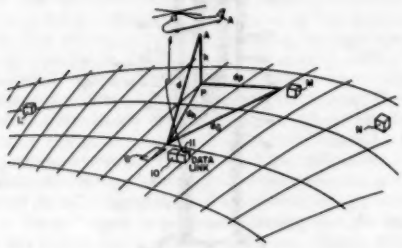


A levitational magnetic field suspends a magnetic body in space and when shielded from the earth's magnetic field, its upward pull and the pull of gravity are equal and opposite and the body is suspended. When unshielded, the electromagnet is additionally exposed to the earth's magnetic field as well as to the levitational field and the body remains suspended. In both cases, an electrical signal dependent upon the intensity of the levitational field is produced. The difference between the value of this signal when the electromagnet is shielded and when the electromagnet is not shielded provides a measure of the intensity of the earth's magnetic field.

3,721,985
NAVIGATIONAL SYSTEM

Thomas E. Perfitt, Grand Rapids, Mich., assignor to Lear Siegler, Inc., Grand Rapids, Mich.

Filed June 22, 1970, Ser. No. 48,409
Int. Cl. G01s 1/24
U.S. Cl. 343—103 23 Claims

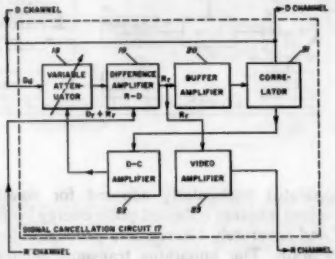


Loran navigational signals are received at a destination and at dirigible craft traveling towards that destination. The time differences between signals received at the destination are calculated. Upon receipt of a signal from a master station, these time differences at the destination are signaled to the craft by a data link or slave signal. The craft also receives the signal from the master station. The relative positions of the destination and the craft are determined in accordance with Loran navigation techniques. This position information is then utilized, along with the time difference information transmitted to the craft simultaneously with the master signal by the data link or slave signal, and the slant range between the craft and the destination is then computed. Altitude of the craft is then computed, as by triangulation. The slant range rate is determined by measuring the Doppler shift in the frequency of the data link or slave signal.

3,721,986
RANGE MEASURING SYSTEM

Stanley I. Kramer, Brightwaters, N.Y., assignor to Fairchild Industries, Inc. Germantown, Md.

Filed April 21, 1960, Ser. No. 23,849
Int. Cl. G01s 11/00
U.S. Cl. 343—112 7 Claims

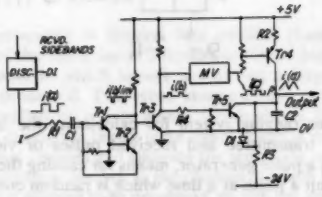


1. In a system for determining the range between two objects, one of the objects radiating electromagnetic wave energy having distinguishable characteristics which arrives at the other object by way of a direct path and a reflected path wherein it is reflected off of a surface, an apparatus comprising a direct channel and a reflected channel, both said direct and said reflected channels receiving direct and reflected waves by way of the two paths, variable means responsive to one of said direct and reflected channels for making the direct wave on said direct channel substantially equal in amplitude to the direct wave on said reflected channel, subtracting means responsive to said variable means and to the other of said channels which provides an output representative of the difference between the direct wave on said direct channel and the direct wave on said reflected channel, and correlator means responsive to said subtracting means and to said direct channel for providing a signal representative of the amplitude of said output, the signal from said correlator means being connected to actuate said variable means.

3,721,987
SIGNAL TAPERING AT RECEIVER

Charles William Earp, London, and Martin Brandon, Harlow, both of England, assignors to International Standard Electric Corporation, New York, N.Y.

Filed July 28, 1971, Ser. No. 166,853
Claims priority, application Great Britain, Aug. 5, 1970, 37,729/70
Int. Cl. G01s 3/54
U.S. Cl. 343—113 DE 4 Claims



This invention relates to a receiver in which the received signal is tapered in synchronism with the motion of a swept an-

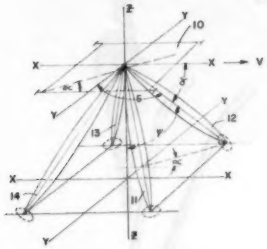
tenna at the transmitter. A triangular waveform, having twice the repetition frequency of a square wave emerging from an F.M. discriminator, is generated.

3,721,988

LEAKY WAVE GUIDE PLANAR ARRAY ANTENNA

Leonard Schwartz, Scarsdale; Donald Z. Blau, City Island, and Edward Chin, New York, all of N.Y., assignors to The Singer Company, Little Falls, N.J.

Filed Aug. 16, 1971, Ser. No. 171,900
Int. Cl. H01q *13/00*
U.S. Cl. 343—756 **11 Claims**



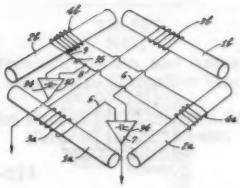
A planar array antenna for producing four squinted beams required for an airborne Doppler navigation system is disclosed. The antenna includes a pair of slotted feed rectangular wave guides arranged to permit input energy to be applied at any one of four ports. Interconnecting and coupled to the feed wave guides by means of slots in the feed wave guides is a radiating member which includes a leaky grid structure through which radiates beam-forming electromagnetic energy. The antenna is a symmetrical structure and the four beam positions, or for the case of a lobe switched antenna system, the four beam sets, are symmetrically located with respect to the vertical axis of symmetry of the array.

3,721,989

CROSS LOOP ANTENNA

Albert V. Christensen, Hawthorne, Calif., assignor to Northrop Corporation, Los Angeles, Calif.

Filed June 30, 1971, Ser. No. 158,291
Int. Cl. H01q *7/08*
U.S. Cl. 343—701 **7 Claims**



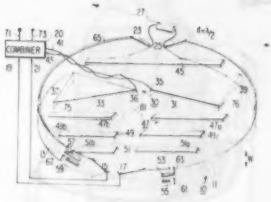
Two orthogonal arrays of ferrite cores wound and connected in series. The arrays are insulated from each other to provide predictable inductance. The arrays preferably form a square inside of which a low-noise amplifier is connected directly to each array, the amplifiers forming a built-in part of the antenna assembly. A design for a small, narrow-band 10 KHz to 14 KHz antenna is described, having a large effective height.

3,721,990

PHYSICALLY SMALL COMBINED LOOP AND DIPOLE ALL CHANNEL TELEVISION ANTENNA SYSTEM

John James Gibson, Princeton, and Donald William Peterson, Maple Shade, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Dec. 27, 1971, Ser. No. 212,431
Int. Cl. H01q *21/00*
U.S. Cl. 343—726 **12 Claims**



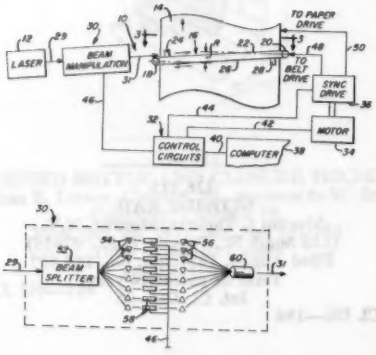
A low cost, physically small, all channel television antenna system is provided for reception in high signal strength areas. The antenna is characterized by a loop having a pair of separated gaps, one of which is a feed gap and the other an impedance termination gap for operating as a directional reception antenna at the low and high VHF television frequency bands. Inboard the loop is placed a television band UHF dipole antenna. The input terminals of the dipole antenna and the feed terminal of the loop antenna are each coupled to a combiner with a single output from the combiner.

3,721,991

LASER LINE PRINTER

R. Kaufman, and Daniel R. Strick, both of Pittsburgh, Pa., assignors to Craig R. Kaufman, Lois J. Kaufman, Irving R. Kaufman, Benjamin M. Wedner, Daniel R. Strick, all of Pittsburgh, Pa., part interest to each

Filed July 8, 1971, Ser. No. 160,752
Int. Cl. G05k *15/02*
U.S. Cl. 346—108 **5 Claims**



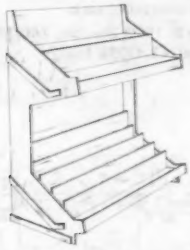
A general purpose printer, particularly suitable for use as an output device for a computer, wherein the paper moves continuously, is disclosed. A belt having an inclined top run carries a mirror in front of the paper. The data to be printed is carried on and is made to operate an array of small laser beams directed at the mirror. By synchronization of paper motion, belt motion, and laser beam operation, straight lines of the data are generated on the moving paper by the continuously moving mirror carrying belt.

DESIGNS

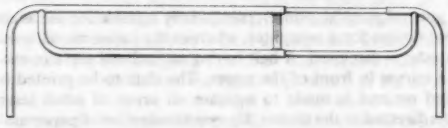
MARCH 20, 1973

226,511
CHAIR
Milton Stern, 1631 Walnut Ave., Wilmette, Ill. 60091
Filed June 14, 1971, Ser. No. 153,147
Term of patent 14 years
Int. Cl. D6—*02*
U.S. Cl. D6—68

226,512
CASCADE TYPE MERCHANDISING RACK
John F. Gray, N. Old Barrington Road, Barrington, Ill. 60010
Filed Aug. 12, 1971, Ser. No. 171,406
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—190

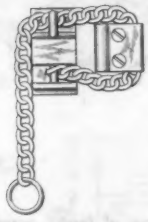


226,513
BEDSIDE RAIL
Morton I. Thomas, Monroe, N.Y. (125 South St., Passaic, N.J. 07055)
Filed Aug. 5, 1971, Ser. No. 169,597
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—198



226,514
GRASS CUTTING SHEARS
Edward Albert Rogers, London, England, assignor to Wilkinson Sword Limited, London, England
Filed Feb. 19, 1971, Ser. No. 117,184
Claims priority, application Great Britain Aug. 29, 1970
Term of patent 14 years
Int. Cl. D8—*01*
U.S. Cl. D8—5

226,515
SLIDING DOOR CHAIN GUARD
Louis G. Bobrowski, Berlin, Conn., assignor to The Stanley Works, New Britain, Conn.
Filed Sept. 8, 1971, Ser. No. 178,853
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—131



226,516
ESCUTCHEON PLATE WITH PUSHBUTTON FOR DOORBELLS
Lawrence P. Mellyn, Glocester, R.I., assignor to General Electric Company
Filed Mar. 27, 1972, Ser. No. 238,746
Term of patent 14 years
Int. Cl. D8—*09*
U.S. Cl. D8—181

226,517
ESCUTCHEON PLATE WITH PUSHBUTTON FOR DOORBELLS
Lawrence P. Mellyn, Glocester, R.I., assignor to General Electric Company
Filed Mar. 27, 1972, Ser. No. 238,747
Term of patent 14 years
Int. Cl. D8—*09*
U.S. Cl. D8—181

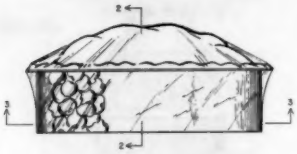
226,518
NUT
Richard H. Wetherill, Morton, and Anton T. Gregg, East Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.
Filed Dec. 21, 1970, Ser. No. 26,589
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—273

226,519
BOTTLE
Howard Cooper, Suite 7707, 175 E. Delaware, Chicago, Ill. 60611
Filed Jan. 8, 1971, Ser. No. 105,143
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—28

226,520
BOTTLE
Howard Cooper, Suite 7707, 175 E. Delaware, Chicago, Ill. 60611
Filed Nov. 18, 1971, Ser. No. 200,282
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—39

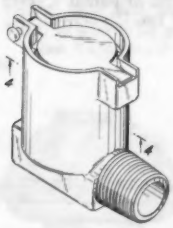
226,521
COMBINED BOTTLE AND CLOSURE THEREFOR
Nathan B. Lerner, Chicago, Ill., assignor to W. Braun Company, Chicago, Ill.
Filed Oct. 20, 1971, Ser. No. 191,153
Term of patent 7 years
Int. Cl. D9—*01*
U.S. Cl. D9—118

226,522
PACKAGED PIE
Peter C. Dendrinos, Traverse City, Mich., assignor to Chef Pierre, Inc., Traverse City, Mich.
Filed Oct. 15, 1970, Ser. No. 25,510
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—193



226,523
UNDERGROUND FLOW CONTROL VALVE ACCESS HOUSING AND COMBINED COVER AND BASE THEREFOR
John H. Thornton, Sr., Sheboygan, Wis., assignor to Ametek, Inc., Sheboygan, Wis.
Filed Apr. 1, 1971, Ser. No. 130,184
Term of patent 14 years
Int. Cl. D25—*99*
U.S. Cl. D13—1 R

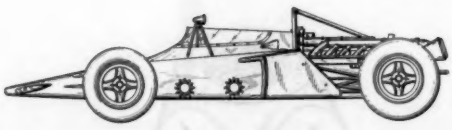
226,524
PRESSURE RELIEF VALVE
Frederick J. Brindisi, Rochester, N.Y., assignor to Qualitrol Corporation, Fairport, N.Y.
Filed Mar. 16, 1971, Ser. No. 124,999
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—19



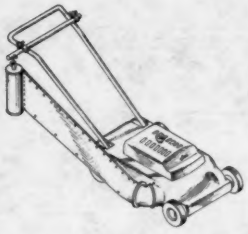
226,525
ELECTRONIC CALCULATING MACHINE
Shigetoshi Hazama, Osaka, Japan, assignor to Sharp Kabushiki Kaisha (Sharp Corporation) Osaka, Japan
Filed Feb. 8, 1971, Ser. No. 113,804
Claims priority, application Japan Aug. 14, 1970
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C

226,526
GOLF PUTTER HEAD
Edward L. Cicero, 52—62 66th St., Maspeth, N.Y. 11378
Filed Oct. 27, 1970, Ser. No. 25,685
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5

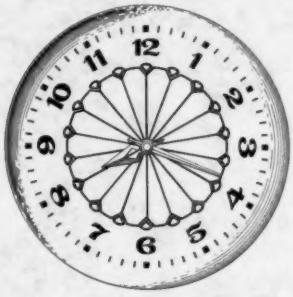
226,527
MODEL RACING CAR
Gordon Leonard Coppuck, Camberley, England, assignor to Bruce McLaren Motor Racing Limited, Colnbrook, Buckinghamshire, England
Filed July 20, 1971, Ser. No. 164,482
Claims priority, application Great Britain Jan. 21, 1971
Term of patent 7 years
Int. Cl. D21—*01*
U.S. Cl. D34—15



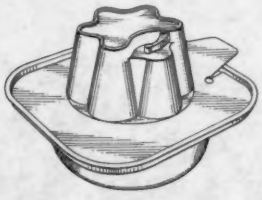
226,528
COMBINED LAWN MOWER AND GRASS CATCHER
Clifford E. Cressy, 7006 Indianapolis Blvd., Hammond, Ind. 46324
Filed Oct. 13, 1971, Ser. No. 189,071
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D40—1 B



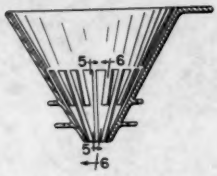
226,529
CLOCK OR SIMILAR ARTICLE
Theodore G. Daher, Stratford, Conn., assignor to General Electric Company
Filed June 10, 1971, Ser. No. 152,004
Term of patent 3½ years
Int. Cl. D10—*01*
U.S. Cl. D42—7



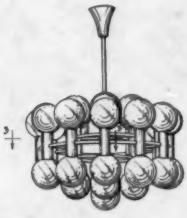
226,530
MOLD FOR COMESTIBLES OR SIMILAR ARTICLES
Daniel Carasso, Paris, France, assignor to Compagnie Gervais-Danone, Courbevoie, France
Filed Jan. 29, 1971, Ser. No. 111,168
Claims priority, application France Dec. 8, 1970
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D44—1 L



226,531
FILTER DRIP ADAPTER FOR COFFEE MAKER
Glenn B. Beckman, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.
Filed Mar. 19, 1971, Ser. No. 126,399
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D44—26 B

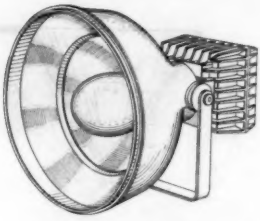


226,532
CHANDELIER
Motoko Ishii, Tokyo, Japan, assignor to Yamagiwa Electric Company, Ltd., Tokyo, Japan
Filed Apr. 13, 1971, Ser. No. 133,770
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—3

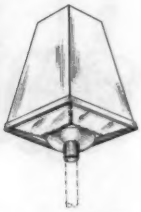


226,533
LAMP
Richard C. Porter, 22325 Nancy, Southfield, Mich. 48075
Filed June 9, 1971, Ser. No. 151,623
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—20

226,534
FLOODLIGHT
Eldon L. Anderson, Jr., Fletcher, N.C., assignor to General Electric Company
Filed Sept. 17, 1971, Ser. No. 181,657
Term of patent 14 years
Int. Cl. D26—*03*
U.S. Cl. D48—20 K



226,535
LUMINAIRE
Eldon L. Anderson, Jr., Fletcher, N.C., assignor to General Electric Company
Filed Oct. 15, 1971, Ser. No. 189,801
Term of patent 14 years
Int. Cl. D26—*03*
U.S. Cl. D48—31

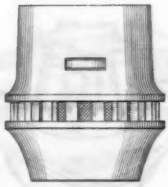


226,536
TELEVISION RECEIVER
Masaharu Katayama and Noriyuki Arai, Saijo, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Dec. 30, 1970, Ser. No. 26,707
Claims priority, application Japan July 9, 1970
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D56—4

226,537
FREIGHT CAR BODY
Jack Hickman, 5766 Fair Oaks, Carmichael, Calif. 95608
Filed Mar. 1, 1971, Ser. No. 119,995
Term of patent 14 years
Int. Cl. D12—*03*
U.S. Cl. D66—1

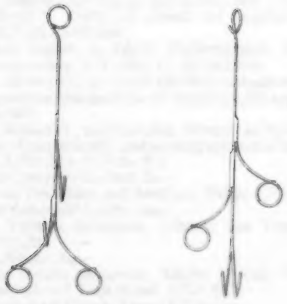
226,538
WATER SKI VEST
Leonard P. Frieder, Jr., Waverly, Pa., assignor to Gentex Corporation, New York, N.Y.
Filed June 9, 1971, Ser. No. 151,617
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D71—1 HH

226,539
FIRE DETECTOR
Duane D. Pearsall, Morrison, Colo., assignor to Statitrol Corporation, Lakewood, Colo.
Filed July 19, 1971, Ser. No. 164,213
Term of patent 14 years
Int. Cl. D29—*02*
U.S. Cl. D72—1 R

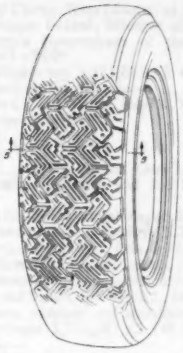


226,540
BARBECUE GRILL AND OVEN UNIT AND STAND THEREFOR
Charles D. Dushek, Lisle, Ill., assignor to Sears, Roebuck and Co., Chicago, Ill.
Filed May 19, 1971, Ser. No. 145,121
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D81—10 E

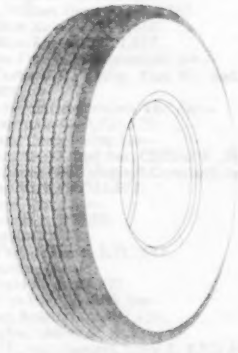
226,541
HANGER RACK FOR INTRAVENOUS BOTTLES
John W. Pryor, 5753 Desert View, La Jolla, Calif. 92037
Filed Mar. 19, 1971, Ser. No. 126,381
Term of patent 14 years
Int. Cl. D24—*02*; D8—*03*
U.S. Cl. D83—1 B



226,542
TIRE
Mario Mezzanotte, Milan, Italy, assignor to Industrie Pirelli S.p.A., Milan, Italy
Filed May 18, 1971, Ser. No. 144,712
Claims priority, application Italy Nov. 18, 1970
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D90—20



226,543
TIRE
Patrick S. Neale, Mogadore, Ohio, assignor to Goodyear Tire & Rubber Company, Akron, Ohio
Filed July 23, 1971, Ser. No. 165,881
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D90—20 R



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TO WHOM

PATENTS WERE ISSUED ON THE 20TH DAY OF MARCH, 1973

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

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A/S Spilka: *See—*
Kvasnes, Harald, 3,721,044.

AB Hagglund & Soner: *See—*
Andersson, Bjorn Axel Henning, 3,721,476.

Abbate, Franklin W.; and Farrissey, William J., Jr., to Upjohn Company, The. Piperazinyl ethyl carbamates. 3,721,674, Cl. 260-268.00r.

Abbott, Thomas I., to Eastman Kodak Company. Mordant vehicle for color image transfer receivers. 3,721,558, Cl. 96-29.00d.

Abe, Takeo: *See—*
Okuma, Kiwamu; and Abe, Takeo, 3,721,538.

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Abex Corporation: *See—*
Blanyer, Carl G., 3,721,859.

Aboif, Joseph A., to International Business Machines Corporation. Method for diffusing zinc into a semiconductor substrate without winging. 3,721,589, Cl. 148-188.000.

Abrams, Arthur B. Vehicle wind tunnel. 3,721,466, Cl. 296-1.00s.

A.C.E. Machinery Limited: *See—*
Hall, Richard John; and Shalders, Alan John, 3,721,319.

Ackermann u. Schmitt KG: *See—*
Csaki, Joachim, 3,721,142.

Adams, James William; and Hoftiezer, Henry Wilbert, to American Can Company. Builder for phosphate-free detergent compositions. 3,721,627, Cl. 252-89.000.

Addis, Kenneth J., to Deering Milliken Research Corporation. Method and apparatus for securing a continuous thread on a support surface. 3,721,599, Cl. 156-394.000.

Adler, Ralph Michael. Marine refrigeration, freezing and cool storage systems. 3,721,104, Cl. 62-240.000.

Aerostatic Limited: *See—*
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Agfa-Gevaert Aktiengesellschaft: *See—*
Szostak, Roland; Hartwig, Karl; Maurischat, Gunter; Schnall, Gunter; and Vossnacke, Jurgen, 3,721,209.

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Heugebaert, Frans Clement; and Brinckman, Eric Maria, 3,721,560.
Van Listhout, Jan August; and Jaeken, Jan, 3,721,823.

Agnew, Boyd F. Clean air system for hospital operating rooms. 3,721,067, Cl. 55-97.000.

Ahlen, Karl Gustav, to S.R.M. Hydiomekanik, AB. Hydrodynamic torque converters. 3,721,090, Cl. 60-362.000.

Ahlstone, Arthur G., to Vetco Offshore Industries, Inc. Marine riser liner apparatus and methods of installing such apparatus. 3,721,292, Cl. 166-.500.

Ahlstone, Arthur G.; and Larralde, Edward, to Vetco Offshore Industries, Inc. Compensating and sensing apparatus for well bore drilling vessels. 3,721,293, Cl. 166-.500.

Aisin Seiki Company Limited: *See—*
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Aktiengesellschaft Brown, Boveri & Cie: *See—*
Wehrli, Robert, 3,721,787.

Albert, Aristide A., to United Aircraft Corporation. Helicopter floating stabilator control system. 3,721,404, Cl. 244-17.190.

Albrecht, Rudolf: *See—*
Rufer, Clemens; Albrecht, Rudolf; Kessler, Hans-Joachim; and Schroder, Eberhard, 3,721,668.

Alelio, Gaetano F. D. Reactive hydroxyalkyl-onium catalysts for synthesis of polyoxazolidones. 3,721,650, Cl. 260-47.0ep.

Alessio, Dino, to H.G. Enterprises. Heel and ankle protector. 3,721,237, Cl. 128-149.000.

Alexander, Robert Warren: *See—*
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Allard, Robert; and Clarke, John Lawton, to United Kingdom of Great Britain and Northern Ireland, Minister of Aviation Supply in Her Britannic Majesty's Government of the. Pulse radar ranging. 3,721,981, Cl. 343-13.00r.

Allen, William R. Flicker toy. 3,721,037, Cl. 46-62.000.

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Allison, Rudolph L.; and Lindstrand, Gary L., to MTL, Incorporated. Machine for sealing balloons and the like. 3,720,991, Cl. 29-211.00d.

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Allport, Maurice James, to Lucas, Joseph, (Industries) Limited. Battery charging systems for road vehicles. 3,721,888, Cl. 320-64.000.

Allten, Alfred G.; and Semel, Frederick J., to Wood, Alan, Steel Company. Low carbon, niobium and aluminum containing steel sheets and plates and process. 3,721,587, Cl. 148-36.000.

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Anderson, Charles E. Toboggan tow-bar. 3,721,454, Cl. 280-24.000.

Anderson Electric Corporation: *See—*
Seaquist, James J., 3,721,748.

Anderson, Theodore D.; and Harms, William J., to Gardner-Denver Company. Linear antifriction bearing. 3,721,478, Cl. 308-6.00c.

Andersson, Bjorn Axel Henning, to AB Hagglund & Soner. Track chain for tracked vehicles. 3,721,476, Cl. 305-35.00r.

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Andrews, Charles Luther, to General Electric Company. Microwave detection instrument and antenna therefor. 3,721,900, Cl. 324-95.000.

Anspacher, William B., to United States of America, Navy. Rotating surveillance vehicle. 3,721,410, Cl. 244-314.000.

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Applegate, Lindsay M. Lift control for rail car. 3,721,198, Cl. 104-23.00r.

Applegate, Robert D., to Driall Driers, Inc. Chemical applicator for grain. 3,721,179, Cl. 99-487.000.

Aranguren, William Louis, to Bell Telephone Laboratories, Incorporated. Trigger circuit having the same level turnon and turnoff thresholds. 3,721,911, Cl. 328-146.000.

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Arikawa, Masayasu; Kano, Motomi; and Okuda, Naoki, to Kobe Steel, Ltd. Welding process and plural layered backing material. 3,721,797, Cl. 219-137.000.

Arneson, Edwin L., to Federal Paper Board Company, Inc. Bottle carrier package. 3,721,338, Cl. 206-65.00e.

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Atkinson, Cyril John, to International Computers Limited. Web feeding apparatus. 3,721,377, Cl. 226-74.000.

Atkinson, Everett J.; Sager, James R.; and Bensch, Alan C., to Owens-Illinois, Inc. Method and apparatus for monitoring surface coatings. 3,721,501, Cl. 356-201.000.

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Auphan, Michel Joseph; and Perilhou, Jean Robert, to U.S. Philips Corporation. Camera scanning device and analysing apparatus comprising such a device. 3,721,758, Cl. 178-7.200.

Austin, Timothy K., to Container Corporation of America. Display device. 3,721,029, Cl. 40-124.100.

Automation Industries, Inc.: *See—*
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Automobiles Peugeot: *See—*
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Awakura, Yukio: *See—*
Kawase, Toshiharu; and Awakura, Yukio, 3,721,475.

Ayella, Robert J., to United States Catheter and Instrument Corporation. Spring guide washer. 3,721,252, Cl. 134-122.000.

Azzalin, Bruno; and Bettini, Francesco, to Olivetti, Ing. C., & C., S.p.A. Device for rewinding the paper tape used for writing in calculating machines. 3,721,398, Cl. 242-67.300.

Bacher, Charles. Laminated trimmer for high pressure laminated materials. 3,721,157, Cl. 90-18.000.

Bacon, Charles H., Company, mesne: *See—*
George McCona L., 3,721,203.

Bader, Horst, to Eckardt, J. C., AG. Pneumatic pressure controller position adjusting. 3,721,422, Cl. 251-28.000.

Badische Anilin & Soda-Fabrik Aktiengesellschaft: *See—*
Mueller, Albrecht; Osieka, Hans; and Pommer, Ernst-Heinrich, 3,721,709.

Badische Anilin- & Soda-Fabrik Aktiengesellschaft: *See—*
Wilhelm, Hans; Gulbins, Klaus; and Hartmann, Heinrich, 3,721,640.

Baglai, Vitaly Mikhailovich: *See—*
Paton, Boris Evgenievich; Medovar, Izrailevich Boris; Latash, Jury Vadimovich; Chekotilo, Leonty Vasilievich; Baglai, Vitaly Mikhailovich; Artamonov, Viktor Leonidovich; Garkaljuk, Rodimir Ivanovich; Timchenko, Viktor Anatolievich; Malichekno, Evgeny Fedorvich; Stupak, Leonid Mikhailovich; and Dubinsky, Rudolf Solomonovich, 3,721,286.

Bailey, Guy. Bayonet mounted flexible cleaning pad. 3,720,976, Cl. 15-244.00a.

Bair, Thomas G.: *See—*
McNamara, Joseph P.; and Bair, Thomas G., 3,721,966.

Baker, Charles E., to Texas Instruments, Incorporated. Information display method and system. 3,721,756, Cl. 178-6.000.

Balchunas, Anthony J.: *See—*
Miller, Robert E., Jr.; and Balchunas, Anthony J., 3,720,978.

Ball, Stephen D.; and Kekc, Gary L. Bubble transfer device for open system scuba diving applications. 3,721,235, Cl. 128-142.200.

Baltsas, Stavros; and Patsalos, Peter C. Chance scoring apparatus and method of using same. 3,721,444, Cl. 273-138.00r.

Banes, Ralph E.: *See—*
Visos, Charles D.; Love, John J.; and Banes, Ralph E., 3,721,263.

Banner, Philip M. Navigation calculator. 3,721,007, Cl. 33-1.50d.

Bardehle, Heinz Erich. Diving mask with transparent face plate. 3,721,236, Cl. 128-145.00a.

Bardinet, Guy Marie Paul, to Fabriques de Produits Chemiques de Tham et de Mulhouse. Process for preparing alkyl titanates by transesterification. 3,721,689, Cl. 260-429.500.

Barkow, William Henry; and Gross, Josef, to RCA Corporation. Deflection yoke for use with in-line electron guns. 3,721,930, Cl. 335-213.000.

Barnard, Daniel D., to Bendix Corporation, The. Flow control device with a bistable fluid switch. 3,721,256, Cl. 137-805.000.

Barnes, Carl E., to Radiation Research Corporation. Polymers of 2-pyrrolidone. 3,721,652, Cl. 260-78.00p.

Barnett, David W.: *See—*
Reding, John T.; and Barnett, David W., 3,721,618.

Barratt, John, to Simon-Vicars Limited. Oven control. 3,721,805, Cl. 219-492.000.

Barreca Products Co.: *See—*
Penniman, Robert, 3,721,373.

Barrett, John C.; Bergh, Arndt B.; Price, John E.; and Hornak, Tomas, to Hewlett-Packard Company. Integrated circuit read only memory bit organized in coincident select structure. 3,721,964, Cl. 340-173.0sp.

Barrett, Lawrence G., to American Novawood Corporation, The. Methods for producing plastic composite materials. 3,721,579, Cl. 117-93.310.

Barry, Arthur J.; and Barry, Lawrence J. Pressurized beverage container with twist removable cover. 3,721,361, Cl. 215-50.000.

Barry, Lawrence J.: *See—*
Barry, Arthur J.; and Barry, Lawrence J., 3,721,361.

Barthel, Curtis Wallace, Jr. Exerciser and walker apparatus. 3,721,436, Cl. 272-70.000.

Bartlett, Raymond H. Stump splitter. 3,721,281, Cl. 144-2.00n.

Barz, Alfred: *See—*
Wilmanns, Ingo; and Barz, Alfred, 3,721,897.

Bate, Frederick Douglas Clavell. Automatic sealer control. 3,721,801, Cl. 219-243.000.

Bates Manufacturing Company, The: *See—*
Beger, Richard E., 3,721,485.

Battershall, Barry W.; and Hoffman, William F. Glass tank construction. 3,721,366, Cl. 220-82.00r.

Bauer, Adolf: *See—*
Weber, Karl-Heinz; Zeile, Karl; Dannebert, Peter; Giesemann, Rolf; Bauer, Adolf; Merz, Herbert; and Kuhn, Franz Josef, 3,721,666.

Bauer, Douglas M.: *See—*
Crosby, Philip C.; Goyette, Robert J.; and Bauer, Douglas M., 3,721,001.

Baum, Melvin E., to Koppers Company, Inc. Thickenable unsaturated polyester resin system. 3,721,722, Cl. 260-862.000.

Bayer Aktiengesellschaft: *See—*
Ehrig, Bodo; Muller, Erwin; and Mott, Ludwig, 3,721,648.

Beals, Charles D.; Fitzpatrick, George I.; and O'Hara, Kim L., to Esso Research and Engineering Company. Measuring pressure in a tubular reactor for polyethylene. 3,721,126, Cl. 73-388.00r.

Becker, James R.; and Furlow, Richard H. Aerosol fire extinguisher and method. 3,721,300, Cl. 169-31.00r.

Becker, Richard W.; and Dappen, Glen M., to Eastman Kodak Company. Diffusion transfer reception elements film units and processes therefor. 3,721,555, Cl. 96-29.00d.

Beckwith, Robert W. Regulator control. 3,721,894, Cl. 323-20.000.

Becton, Dickinson and Company: *See—*
Hadtke, Frederick B.; and Galen, Martin P., 3,721,234.
Hubert, Franz Hans, 3,721,231.

Befferman, Lawrence H. Initial condition indication. 3,721,019, Cl. 35-1.000.

Beger, Richard E., to Bates Manufacturing Company, The. Telephone index device. 3,721,485, Cl. 312-330.000.

Behrens, Robert Nick, to Deere & Company. Adjustable mower suspension system. 3,721,076, Cl. 56-14.900.

Behring Corporation: *See—*
Brown, Victor E.; Mora, Paul L.; and Evans, Morton I., 3,720,995.

Beidel, Robert Gary; Burns, Thomas Victor; and Catterall, John Mason, to Bell Telephone Laboratories, Incorporated. Sequential gating circuit. 3,721,770, Cl. 179-27.00d.
Beierer, Joachim, to Siemens Aktiengesellschaft. Pressure gas switch. 3,721,798, Cl. 219-209.000.
Belcher, Richard A., to Chase-Shawmut Company, The. Cartridge fuse having blown fuse indicator. 3,721,936, Cl. 337-241.000.
Beld, John W.: *See—*
Klohr, Robert; Tascher, Edward R.; Beld, John W.; and Koenig, Elmer A., 3,721,241.
Belknap, Louis S., to Cabot Corporation. Aluminum trichloride production. 3,721,731, Cl. 423-264.000.
Bell & Howell Company: *See—*
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Bell Telephone Laboratories, Incorporated: *See—*
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Beidel, Robert Gary; Burns, Thomas Victor; and Catterall, John Mason, 3,721,770.
Benson, George Mead, 3,721,829.
Bergman, John George, Jr.; Crane, Glen Robert; and McFee, James Hoffman, 3,721,831.
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McKeown, James E.; Linkroum, Irving E.; and Phinney, Earl M., 3,721,885.
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Phinney, Earl M.; and Linkroum, Irving E., 3,721,886.
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Ryan, Merle E.; and Stremel, William D., 3,721,047.
Thakore, Kaushik H., 3,721,884.
Benitez, Armando R.: *See—*
Sholl, Arthur F.; Wolfe, Donald L.; and Benitez, Armando R., 3,721,267.
Bennett, Derek J., to EMI Limited. Improvements relating to hydrophones. 3,721,953, Cl. 340-8.00s.
Bennett, Richard J.; and Louthan, Rector P., to Phillips Petroleum Company. Plasticized sulfur, bituminous or asphalt impregnated fabric. 3,721,578, Cl. 117-92.000.
Bensch, Alan C.: *See—*
Atkinson, Everett J.; Sager, James R.; and Bensch, Alan C., 3,721,501.
Benson, George Mead, to Bell Telephone Laboratories, Incorporated. Autobalanced diode bridge sampling gate. 3,721,829, Cl. 307-235.000.
Benson, Harvey D.: *See—*
Palopoli, Frank P.; and Benson, Harvey D., 3,721,712.
Berenbaum, Arthur; and McDonough, Robert M., to Philco-Ford Corporation. Key-operated television channel selector. 3,721,926, Cl. 334-7.000.
Berger, Joel G.: *See—*
Stogryn, Eugene L.; Berger, Joel G.; and Bosniack, David S., 3,721,698.
Bergh, Arndt B.: *See—*
Barrett, John C.; Bergh, Arndt B.; Price, John E.; and Hornak, Tomas, 3,721,964.
Bergman, John George, Jr.; Crane, Glen Robert; and McFee, James Hoffman, to Bell Telephone Laboratories Incorporated. Optical second harmonic generators employing thiocyanate crystals. 3,721,831, Cl. 307-88.300.
Bergmann, Oswald R.; and Coursen, David L., to Du Pont de Nemours, E. I., and Company. Drill-and-blast module. 3,721,471, Cl. 299-55.000.
Bergmeyer, Hans Ulrich: *See—*
Gruber, Wolfgang; Bergmeyer, Hans Ulrich; Werner, Wolfgang; Bernt, Erich; and Gawehn, Karlfried, 3,721,607.
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Berkman, John W.; Lagergren, Richard E.; Ricklefs, Merlin J.; and Schaffer, Walter S., to International Business Machines Corporation. Pneumatic read head for document cards. 3,721,781, Cl. 200-46.000.
Bernardi, Giancarlo: *See—*
Sianesi, Dario; Bernardi, Giancarlo; and Veroli, Gianfranco, 3,721,638.
Bernstein, Jack; and Losee, Kathryn Alice, to Squibb, E. R., & Sons, Inc. Radiopaque triiodoalkylureido benzoic acids. 3,721,701, Cl. 260-471.00r.
Bernt, Erich: *See—*
Gruber, Wolfgang; Bergmeyer, Hans Ulrich; Werner, Wolfgang; Bernt, Erich; and Gawehn, Karlfried, 3,721,607.
Berson, Bertrand Edward; and Upadhyayula, Chainulu Lakshminarsimha, to RCA Corporation. Variable delay line utilizing one part reflection type amplifier. 3,721,924, Cl. 333-31.00r.
Bethlehem Steel Corporation: *See—*
Young, Harold K.; and Wald, Herbert, 3,721,429.
Bettini, Francesco: *See—*
Azzalin, Bruno; and Bettini, Francesco, 3,721,398.
Bexell, Joel L.: *See—*
Fisch, Richard S.; Newman, Norman St. Paul; and Bexell, Joel L., 3,721,563.
Bice, Charles D.; Senchur, Frank W.; and Few, Robert A., to Westinghouse Electric Corporation. Contact-pressure linkage for a circuit interrupter of the torsion-spring type. 3,721,790, Cl. 200-170.00a.
Bieberbach, George: *See—*
Massaro, Anthony A., Jr.; and Bieberbach, George, 3,721,291.
Bierwirth, Henry C.; and Foty, James V., to Lear Siegler, Inc. Mounting for roof top air condition. 3,721,106, Cl. 62-297.000.
Billard, Jacques: *See—*
Lamy, Michel; and Billard, Jacques, 3,721,921.
Billi, G., & C. S.p.A.: *See—*
Billi, Giorgio, 3,721,111.
Billi, Giorgio, to Billi, G., & C. S.p.A. Closed toe hosiery. 3,721,111, Cl. 66-187.000.
Birke, Walter: *See—*
Von Der Eltz, Hans-Ulrich; Gross, Richard; and Birke, Walter, 3,721,524.
Bissell Inc.: *See—*
Rosendall, Henry J., 3,720,974.
Black, Bobby E., to PSI Products, Inc. Gasket assembly for pipe flanges. 3,721,452, Cl. 277-9.000.
Black, James R.; and Philofsky, Elliott, to Motorola, Inc. Eutectic plating and breaking silicon wafers. 3,720,997, Cl. 29-583.000.
Black, Marion R. Electrical switch indicator. 3,721,789, Cl. 200-167.00r.
Blake, Claude L.: *See—*
Sisler, Robert R.; and Blake, Claude L., 3,721,015.
Blakeslee, A. Eugene, to International Business Machines Corporation. Vapor phase epitaxial deposition process and forming superlattice structure. 3,721,583, Cl. 117-215.000.
Blanton, Grover, to Steer Safe, Inc. Wheel stabilizer. 3,721,455, Cl. 280-94.000.
Blanyer, Carl G., to Abex Cooration. Railway wheel sensor. 3,721,821, Cl. 246-24.000.
Blanyer, Carl G., to Abex Corporation. Metal object sensor, particularly for railway wheels. 3,721,859, Cl. 317-5.000.
Blattner, Karl; and Picard, Roland, to Coradi, G., A.G. Photoelectric device for recording symbols and for drawing small diagrams at high recording and drawing speed for use in an automatic drafting machine. 3,721,164, Cl. 95-1.00r.
Blau, Donald Z.: *See—*
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Bloom, Albert, to Industrial Dyestuff Company. Process for obtaining 2,4,7-trinitrofluorenone. 3,721,713, Cl. 260-590.000.
Bloom, Quentin M. Galvanizing wire. 3,721,520, Cl. 432-143.000.
Blum, Marshall R. Dispenser apparatus for disposable carton. 3,721,370, Cl. 222-385.000.
Bobst, Gerhard, to Von Roll AG. Axial piston hydraulic apparatus. 3,721,161, Cl. 91-486.000.
Bodolay, William A. Automatic bag neck gatherer and tying mechanism. 3,721,061, Cl. 53-135.000.
Boehringer Ingelheim G.m.b.H.: *See—*
Weber, Karl-Heinz; Zeile, Karl; Dannebert, Peter; Giesemann, Rolf; Bauer, Adolf; Merz, Herbert; and Kuhn, Franz Josef, 3,721,666.
Boehringer Mannheim GmbH: *See—*
Gruber, Wolfgang; Bergmeyer, Hans Ulrich; Werner, Wolfgang; Bernt, Erich; and Gawehn, Karlfried, 3,721,607.
Boeing Company, The: *See—*
Hurlbert, Clifford F., 3,721,406.
MacKinnon, Malcolm Lain K.; and Syltebo, Bjarne E., 3,721,389.
Boekkooi, Anton; Hurx, Ardianus Antonius; Van Der Tas, Johannes Cornelis; and Meulemans, Charles Cornelis, to U.S. Philips Corporation. Combustion flash bulb. 3,721,515, Cl. 431-95.000.
Boel, Charles; Pot, Francois; and Sachot, Claude, to Houilleres du Bassin du Nord & Du Pas-De-Calais. Multi-storey building comprising unit compartments. 3,721,052, Cl. 52-79.000.
Boensel, Donald W., to International Telephone and Telegraph Corporation. Composite digital logic microwave phase shifter. 3,721,922, Cl. 333-24.100.
Bogese, Stephen B., to Virginia Plastics Company. Braided cable cover removing machine. 3,720,973, Cl. 15-88.000.
Bokov, Vladimir Mikhailovich: *See—*
Skachko, Jury Nikolaevich; Moshkin, Venedikt Feofanovich; Garkaljuk, Rodimir Ivanovich; Popov, Nikolai Vladimirovich; Polukhin, Valery Vasilievich; Korshunov, Igor Illarionovich; Bokov, Vladimir Mikhailovich; and Skorudsky, Boris Pavlovich, 3,721,793.
Bolinger, Donald B. Wick holding attachment for candle molds. 3,721,419, Cl. 249-93.000.
Boller, William A. Bomb recovery and shield apparatus. 3,721,201, Cl. 109-49.500.
Bolt Associates, Inc.: *See—*
Chelminski, Stephen V., 3,721,095.
Bond, John J. Spring attachment clip. 3,720,960, Cl. 5-259.00r.
Booker, William E. Commercial barbeque cooker. 3,721,177, Cl. 99-331.000.

Boone, Jerry C., to Allis-Chalmers Corporation. Combine grain bin unloader. 3,721,333, Cl. 198-119.000.

Borg-Warner Corporation: *See—*
Kelly, Robert R.; and Ward, Donald H., 3,721,780.

Borneman, Glenn S. Universal joint bearing cup improvement. 3,721,110, Cl. 64-17.00a.

Bosch, Robert, G.m.b.H.: *See—*
Gumbert, Paul, 3,721,878.
Nier, Johannes, 3,720,999.

Bosniack, David S.: *See—*
Stogryn, Eugene L.; Berger, Joel G.; and Bosniack, David S., 3,721,698.

Bosse, Frank, to Windmoller & Holscher. Apparatus for applying heat-sealed seams to at least two-ply composite material of which the confronting plies. 3,721,602, Cl. 156-583.000.

Boston, Tommy E.: *See—*
Brandt, William L.; Boston, Tommy E.; and Reed, Don E., 3,721,103.

Bott, Lawrence L., to Nalco Chemical Company. Secondary recovery of petroleum. 3,721,295, Cl. 166-295.000.

Bouchet, Robert, to Naphtachimie. Reactor for preparation of chlorohydrins of 1,2-glycols. 3,721,530, Cl. 23-285.000.

Bovio, Robert J., to GTE Sylvania Incorporated. Cold trap. 3,721,100, Cl. 62-55.500.

Bowen, Charlie L. Wood lathe. 3,721,279, Cl. 142-1.000.

Boyles, Robert L.; and Polonsky, Samuel, to General Electric Company. Digital clock. 3,721,087, Cl. 58-125.00e.

Brachet, Alain; and Lannou, Louis, to Electricite de France (Service National). Method for detecting steam leakage in a heat exchanger having circulation tubes surrounded by liquid sodium and devices for the application of said method. 3,721,116, Cl. 73-40000.

Bramley, Arthur. Light scanning by interference grating and method. 3,721,486, Cl. 350-6.000.

Brandli, Ronald I.; and Gjovik, James R., to Textron, Inc. Snowmobile suspension system. 3,721,308, Cl. 180-5.00r.

Brandon, Martin: *See—*
Earp, Charles William; and Brandon, Martin, 3,721,987.

Brandt, George W.; and Hague, Joe T., to General Electric Company. Terminal assembly. 3,721,948, Cl. 339-176.00r.

Brandt, Maurice W.; and Shears, Franklin J., to Gerber Products Company. Grain steaming apparatus. 3,721,018, Cl. 34-168.000.

Brandt, William L.; Boston, Tommy E.; and Reed, Don E., to Olin Corporation. Method for making hollow ice bodies. 3,721,103, Cl. 62-73.000.

Branson Instruments, Incorporated: *See—*
Kramer, George C., 3,721,833.

Braumann, Gundokar; Stocker, Helmut; and Hillenbrand, Dieter, to Siemens Aktiengesellschaft. Bistable polarized electromagnetic relay. 3,721,927, Cl. 335-179.000.

Braun, C. F., & Co.: *See—*
Wright, Lee E.; and Pickford, Allan E., 3,721,532.

Braun, Leonard C.; and Klygis, M. Julius, to Illinois Tool Works Inc. Quick opening container package. 3,721,337, Cl. 206-65.00e.

Bray, Andrew M., to Magna-Graphics Corporation. Magnetic print cylinder. 3,721,189, Cl. 101-382.0mv.

Breinlinger, Richard H.: *See—*
Villalobos, Luis F.; Harano, Allen A.; and Breinlinger, Richard H., 3,721,810.

Brennen, Michael B.; and Watson, Guido, to Westinghouse Electric Corporation. Electrical apparatus including a ground fault sensor. 3,721,862, Cl. 317-18.00d.

Bressler, Marcus N.; and Sebelish, Norman C., to Gulf & Western Industries, Inc. Quick-opening manway closure. 3,721,363, Cl. 220-32.000.

Brick, Julius H.; and Olschewski, Wilfred. Temperature-volume controlled mixing valve. 3,721,386, Cl. 236-12.00a.

Brickman, Norman F.; and Freeman, Leo B., Jr., to International Business Machines Corporation. Repairable semiconductor circuit element and method of manufacture. 3,721,838, Cl. 307-303.000.

Bridges, Thomas F.; Knight, George R., Jr.; and Mertl, Ivan, to McMullen, John J., Associates, Inc. Double wall corrugated lng Tank. 3,721,362, Cl. 220-9.01g.

Briggs, Angelis R.; and Maxwell, Thomas J., to Du Pont de Nemours, E. I., and Company. Process for preparing powder blends. 3,721,725, Cl. 264-6.000.

Briley, George C.; Shepherd, James J.; and Lyons, Thomas A., to Cluett, Peabody & Co., Inc., mesne. Ammonia effluent recovery and liquefaction from textile treating zone. 3,721,097, Cl. 62-11.000.

Brill, Frank Daniel: *See—*
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Brinckman, Eric Maria: *See—*
Heugebaert, Frans Clement; and Brinckman, Eric Maria, 3,721,560.

Brink, Cecil A. Tiltable hopper elevator apparatus. 3,721,332, Cl. 198-94.000.

Brinkman, John D.; Paradise, Ronald Y.; and Prill, Robert S., to Singer Company, The. High speed analog-to-digital converter. 3,721,975, Cl. 340-347.0ad..

Brinkmann, Frederick J.: *See—*
Deckert, Albert V., Jr.; and Brinkmann, Frederick J., 3,721,096.

Bristol, Stanley M., to Packard Instrument Company, Inc. Apparatus and method for adjusting gain of photomultiplier type scintillation detectors. 3,721,824, Cl. 250-71.50r.

British Aircraft Corporation (A.T.) Limited, mesne: *See—*
Ford, Brian; and Clapp, Malcolm, 3,721,420.

British Industrial Plastics Limited: *See—*
Yates, Raymond W., 3,721,651.

Brock, Gibson E. Self-loading carrier. 3,721,358, Cl. 214-394.000.

Brockman, Herbert P.: *See—*
Homan, Alfred A.; and Brockman, Herbert P., 3,721,763.

Brown & Williamson Tobacco Corporation: *See—*
Grant, Carl C., 3,721,335.

Brown, Scott W.; and Ward, Owen K., to Milestone, Inc. Method and machine for selecting potatoes of given size from massed potatoes of random size. 3,721,345, Cl. 209-107.000.

Brown, Victor E.; Mora, Paul L.; and Evans, Morton I., to Behring Corporation. Module frames and method of making same. 3,720,995, Cl. 29-482.000.

Bruggeman, Frans, to N.V. Bekaert S.A. Animal rearing cages. 3,721,213, Cl. 119-17.000.

Brumberger Co., Inc.: *See—*
Sirinek, Richard, 3,721,449.

Brycki, Wladyslaw. Suction cleaning apparatus. 3,720,977, Cl. 15-321.000.

Buchmann, Johannes Walter: *See—*
Lukaschewitz, Heinz Kurt; Buchmann, Johannes Walter; and Walther, Bernard Lpu, 3,721,364.

Buchmuller, Josef; and Hartlieb, Otto, to Deere & Company. Draft link sway limiting device. 3,721,302, Cl. 172-450.000.

Buckles, John Q. Pruning tool. 3,721,004, Cl. 30-228.000.

Bucyrus-Erie Company: *See—*
Hornagold, John T., 3,721,054.

Budde, Paul B.: *See—*
Tolkmith, Henry; Seiber, James N.; and Budde, Paul B., 3,721,677.

Budzich, Tadeusz, to Weatherhead Company, The. Three slope proportioning valve. 3,721,473, Cl. 303-6.00c.

Buescher, William E., to GTE Sylvania Incorporated. Method of improving adherence of emissive material in thermionic cathodes. 3,720,985, Cl. 29-25.170.

Buhrer, Erwin; and Alt, Anton, to Fischer, Georg, Aktiengesellschaft. Apparatus for reception and discharge of liquid metal. 3,721,432, Cl. 266-38.000.

Bullard, E. D., Company: *See—*
Raschke, Herbert A., 3,720,956.

Buonavita, Carlos E., to Burroughs Corporation. Current monitoring apparatus. 3,721,928, Cl. 335-204.000.

Burgess Micro Switch Company Limited: *See—*
Grieves, Gordon; and Holden, Brian Astbury, 3,721,791.

Burgess, Stanley E. Auto padded windshield. 3,721,468, Cl. 296-84.00k.

Burks, Warren C.; and Lawrence, Jack G. Thermal sensing of current carrying mediums. 3,721,902, Cl. 324-106.000.

Burns, Howard M. Manual dexterity game. 3,721,440, Cl. 273-1.00r.

Burns, Thomas Victor: *See—*
Beidel, Robert Gary; Burns, Thomas Victor; and Catterall, John Mason, 3,721,770.

Burrough, Donald E.; Steuerwald, Wilfred Lee Roy; and Sawyer, Bobby Gene, to Deere & Company. Mowing apparatus. 3,721,079, Cl. 56-305.000.

Burroughs Corporation: *See—*
Buonavita, Carlos E., 3,721,928.

Burton, Dennis Ernest; Newbold, Geoffrey Tattersall; Percival, Albert; Lambie, Alan James; and Sencial, Ian Robert. 2-Trifluoromethyl-or 2-pentafluoroethylbenzimidazole compounds. 3,721,678, Cl. 260-309.200.

Burwell, Stanley J., to Lyons Industries, Inc. Tire grinding feed device. 3,721,392, Cl. 241-301.000.

Bussienne, Christian Edmond, to Constructions Mills-K. Device for mounting rollers on a runway. 3,721,326, Cl. 193-35.00r.

Butler, Tony W., Jr. Tower with rotated cooling assembly. 3,721,290, Cl. 165-85.000.

Bystrianyk, Wasyl; and Sarkozy, Francis A., to Emhart Corporation. Molten glass gob distribution system. 3,721,544, Cl. 65-207.000.

Cabot Corporation: *See—*
Belknap, Louis S., 3,721,731.

Cain, Maurice Edward; Knight, Geoffrey Thomas; Gazeley, Keith Frederick; and Lewis, Peter McHigh, to Natural Rubber Producers' Research Association. Treatment of rubber. 3,721,659, Cl. 260-83.300.

Calgon Corporation: *See—*
Clapham, Thomas Miller, 3,721,072.

Cambridge Instrument Company, Inc.: *See—*
Whitemore, Chatland; and Richardson, Gerald A., 3,721,883.

Campbell, Andrew J. Pair of surgical scissors. 3,721,245, Cl. 128-318.000.

Campbell, James W., to Wetoma Corporation. Discharge unit for panel cutting apparatus. 3,721,140, Cl. 143-157.000.

Campbell, Mahlon E.: *See—*
McConnell, Bobby D.; Lavik, Melvin T.; and Campbell, Mahlon E., 3,721,625.

Campbell, Raymond L., Jr.: *See—*
Tinch, David H.; Campbell, Raymond L., Jr.; Eliahou, Elie S.; and Schmidt, Arthur W., 3,721,960.

Campbell, Robert W., to Phillips Petroleum Company. Polyamide fibers from mixture of bis-(p-aminocyclohexy) methane and 4,4'-methylene dianiline. 3,721,653, Cl. 260-78.00r.

Canadian Cane Equipment Ltd.: *See—*
Miller, Robert Boothe; and Laurie, C. Keith, 3,721,567.

Canadian Patents and Development Limited: *See—*
Miller, Donald G., 3,721,013.
Cannady, William P.: *See—*
Chapman, Charles C.; Cannady, William P.; and Van Pool, Joe, 3,721,720.
Cannon Kabushiki Kaisha: *See—*
Ogiso, Mitsutoshi, 3,721,167.
Canon Inc.: *See—*
Nagashima, Shinichiro; and Tsuchiya, Kaichi, 3,721,554.
Cantarano, Costantino Marcus. Method of producing electrographic image from original provided with a conductivity pattern. 3,721,551, Cl. 96-1.00r.
Cantarutti, Armindo, to NRM Corporation. Tire building machine. 3,721,600, Cl. 156-401.000.
Cantebury Tales, Inc.: *See—*
Macioge, Frank Anthony; and Ingersoll, Henry Grant, 3,721,484.
Carlisle Corporation: *See—*
Ford, Charles R.; and Percifield, Edward K., 3,721,117.
Carlstrom, Ruben. Electric heating source for seats and mattresses and methods of application of the same. 3,721,799, Cl. 219-212.000.
Carolina Steel and Wire Corporation: *See—*
Rauscher, David Albert; and Alexander, Robert Warren, 3,721,277.
Carrier Corporation: *See—*
Neill, Donald E., 3,721,880.
Carson, John Robert, to McNeil Laboratories, Inc. 5-Aroyl-2-(β-hydroxyethyl)-1-loweralkyl-pyrroles. 3,721,680, Cl. 260-326.50j.
Case, J. I., Company: *See—*
Kulhavy, Joseph T., 3,721,162.
Cash, William D.; and Weiner, Murray, to Ciba-Geigy Corporation. Treatment and prophylaxis of thrombocascular diseases with 2-imidazolone derivatives. 3,721,738, Cl. 424-273.000.
Caswell, John: *See—*
Gray, R. Flanagan; Caswell, John; and Muller, William G., 3,721,403.
Caterpillar Tractor Company: *See—*
Farmer, Charles G.; and Loyd, Calvin D., 3,720,993.
Caton, Ronald Morris: *See—*
Hill, Harold Taylor; and Caton, Ronald Morris, 3,721,163.
Catterall, John Mason: *See—*
Beidel, Robert Gary; Burns, Thomas Victor; and Catterall, John Mason, 3,721,770.
Caulier, Paul W.; and Greene, Donald W., to General Electric Co. Computing car locations in a train. 3,721,820, Cl. 246-247.000.
Cautilli, Philip A.: *See—*
Makower, Samuel J.; Cautilli, Philip A.; and Dickstein, Jack, 3,721,636.
Cavanagh, Ronald Patrick; and Wright, Allan Richard, to Northern Electric Company Limited. Dispensing packages. 3,721,382, Cl. 229-52.00b.
Ceccon, Harry L.; and Furumoto, Horace W. Coaxial flashlamp. 3,721,851, Cl. 313-201.000.
Cecil, Olin B.: *See—*
Helms, John D.; and Cecil, Olin B., 3,721,210.
Cenco Medical/Health Supply Corporation: *See—*
Fraser, Douglas S.; and Bender, Charles E., 3,721,181.
Centuri Engineering Company, Inc.: *See—*
Piester, Leroy E.; and Royal, Robert E., 3,721,193.
Ceramic Engineering Limited: *See—*
Work, Peter Twatt, 3,721,262.
Chaintron, Gerard, to Rhone-Poulenc S.A. Process for the separation of lactic acid from water and nitric acid by rapid preevaporation and distillation. 3,721,610, Cl. 203-77.000.
Challacombe, Robert D. Method for cleaning wells. 3,721,297, Cl. 166-299.000.
Chandler Evans Inc.: *See—*
Likavec, Paul F., 3,721,453.
Chaney, Donal W., to Harsco Corporation. Stationary refuse packer and associated container apparatus. 3,721,182, Cl. 100-35.000.
Chapkovich, John Steven, Jr.; and Lee, David Ernest, to United Aircraft Corporation. Universally movable mounting mechanism with locking and unlocking provisions and wherein the unlocking provisions are operable in accordance. 3,721,415, Cl. 248-214.000.
Chapman, Charles C.; Cannady, William P.; and Van Pool, Joe, to Phillips Petroleum Company. Purification of HF catalyst in alkylation process. 3,721,720, Cl. 260-683.480.
Chase-Shawmut Company, The: *See—*
Belcher, Richard A., 3,721,936.
Kozacka, Frederick J., 3,721,935.
Chekotilo, Leonty Vasilievich: *See—*
Paton, Boris Evgenievich; Medovar, Izrailevich Boris; Latash, Jury Vadimovich; Chekotilo, Leonty Vasilievich; Baglai, Vitaly Mikhailovich; Artamonov, Viktor Leonidovich; Garkaljuk, Rodimir Ivanovich; Timchenko, Viktor Anatolievich; Malichekno, Evgeny Fedorvich; Stupak, Leonid Mikhailovich; and Dubinsky, Rudolf Solomonovich, 3,721,286.
Chelminski, Stephen V., to Bolt Associates, Inc. Controllable force method and system of driving piles. 3,721,095, Cl. 61-53.500.
Chemerda, John M.: *See—*
Reinhold, Donald F.; Sletzinger, Meyer; and Chemerda, John M., 3,721,697.
Chemische Werke Huels, A.G.: *See—*
List, Ferdinand; Dodt, Johann; and Alfs, Helmut, 3,721,708.
Chemische Werke Huls Aktiengesellschaft: *See—*
Heidel, Klaus, 3,721,723.
Chenot, Louis A., to Fife Corporation. Roller device with improved hub construction. 3,721,481, Cl. 308-20.000.
Chevron Research Company: *See—*
Singer, Malcolm Scott, 3,721,679.
Straus, Alan E.; Sweeney, William A.; House, Ralph; and Sharman, Samuel H., 3,721,707.
Chiappulini, Ruggero: *See—*
D'Addea, Nunzio; Panzeri, Cesare; and Chiappulini, Ruggero, 3,721,158.
Chicago Swimming Pool Manufacturing Inc.: *See—*
Thomson, David P., 3,720,964.
Chierici, Osvaldo Frank; and Smith, James Thomas, to Holland Company. Hydraulic and resilient cushioned railway car draft appliance. 3,721,351, Cl. 213-8.000.
Childree, Herman I.; and Trawick, Stewart I., 50% to Sabine Manufacturing, Inc. and 50% to Howe-Baker Engineers, Inc. Hot box for asphalt. 3,721,226, Cl. 126-343.50a.
Chin, Edward: *See—*
Schwartz, Leonard; Blau, Donald Z.; and Chin, Edward, 3,721,988.
Chiola, Vincent; Smith, James S.; and Vanderpool, Clarence D., to Sylvania Electric Products, Inc. Refractory metal phosphate and phosphide coatings for refractory metal leads. 3,721,852, Cl. 174-50.640.
Choate, Luther J.; and Click, Gaylon T., to Petro-Tex Chemical Corporation. Oriented polybutene-1 tubing. 3,721,269, Cl. 138-119.000.
Chomerics, Inc.: *See—*
Seeger, Richard E., Jr.; and Lynn, William J., 3,721,778.
Chono, Masazumi: *See—*
Nakajima, Hitoshi; Chono, Masazumi; Taguchi, Masayoshi; Sakurai, Tokio; and Matsuo, Noriak, 3,721,705.
Choshi, Yasuo: *See—*
Murai, Koichi; Akazome, Giichi; Choshi, Yasuo; Kobayashi, Toshiaki; and Tsuji, Atsuo, 3,721,682.
Chrisman, Ernest L., to Nordic Cloud Corporation. Steam generator. 3,721,802, Cl. 219-273.000.
Christensen, Albert V., to Northrop Corporation. Cross loop antenna. 3,721,989, Cl. 343-701.000.
Christian, Donald K.; and Minchey, Jerry M., to Piedmont Engineering and Machine Company, Inc. Tensionless variable feed system for a traveling strip. 3,721,376, Cl. 226-42.000.
Chudgar, Anil H., to Imperial-Eastman Corporation. Hose construction. 3,721,271, Cl. 138-141.000.
Chupp, John P.: *See—*
Darlington, Walter A.; and Chupp, John P., 3,721,737.
Ciba-Geigy AG: *See—*
Rohr, Otto; Ebner, Ludwig; Dittrich, Volker; and Siegle, Heinz, 3,721,741.
Ciba-Geigy Corporation: *See—*
Cash, William D.; and Weiner, Murray, 3,721,738.
Schindler, Walter; and Zust, Armin, 3,721,739.
Schlumbom, Peter; and Gordon, David A., 3,721,654.
Schlumbom, Peter; and Gordon, David A., 3,721,655.
Traber, Walter; Hambock, Heinz; and Weiss, Anton Georg, 3,721,699.
Cicci, George B.: *See—*
Scarnato, Thomas J.; Peacock, Peter J.; Cicci, George B.; Krage, Paul W.; and Kowalik, John J., 3,721,073.
Ciecior, Heinrich; and Herbold, Peter, to Singer Company, The, mesne. Sewing machine and an adapter for changing the elevation thereof. 3,721,206, Cl. 112-258.000.
Cincinnati Milacron Inc.: *See—*
Ma, Carlton Y. W.; and Peter, John W., 3,721,512.
Taylor, Ian K.; and Jones, Maurice R., 3,721,811.
Cinelli, Ermanno: *See—*
Paret, Giancarlo; and Cinelli, Ermanno, 3,721,620.
Cities Service Company: *See—*
Miller, Clarence O.; Welch, Floyd; and McAlister, Charles G. (said Miller assor. to), 3,721,632.
Olechowski, Jerome Robert, 3,721,660.
Versnel, John, 3,721,634.
Clabburn, Robin James Thomas, to Rachem Corporation. Heat recoverable articles. 3,721,749, Cl. 174-88.00r.
Clairol Incorporated: *See—*
Walter, Henry J.; and Levine, Harvey, 3,721,250.
Clapham, Thomas Miller, to Calgon Corporation. Bonded activated carbon air filter. 3,721,072, Cl. 55-387.000.
Clapp, Malcolm: *See—*
Ford, Brian; and Clapp, Malcolm, 3,721,420.
Clark Equipment Company: *See—*
Erickson, Dennis E., 3,721,353.
Williamson, William A., 3,721,357.
Clark, Robert L.: *See—*
Witzel, Bruce E.; Shen, Tsung-Ying; Graham, Patricia M.; Clark, Robert L.; and Pessolano, Arsenio A., 3,721,676.
Clarke, James A., to Fairchild Industries, Inc. Aircraft canopy separation system. 3,721,407, Cl. 244-121.000.
Clarke, John Lawton: *See—*
Allard, Robert; and Clarke, John Lawton, 3,721,981.
Clarkson, W. J., Limited: *See—*
Dodsworth, Alfred Manston Heeley, 3,721,202.
Classen, Franz; and Parrot, Jean-Marc, to Erste Deutsche Floatglas GmbH & Co. OHG. Float glass apparatus with means for inserting wire. 3,721,543, Cl. 65-146.000.
Clegg, Michael Ward: *See—*

Corbett, William George; and Clegg, Michael Ward, 3,721,298.
Cleveland Flux Company: *See—*
Dvorak, Joseph E.; and Wallace, John F., 3,721,547.
Click, Gaylon T.: *See—*
Choate, Luther J.; and Click, Gaylon T., 3,721,269.
Cliff, Thomas Charles, to United Gas Industries Limited. Thermal actuators. 3,721,421, Cl. 251-11.000.
Cluett, Peabody & Co., Inc., mesne: *See—*
Briley, George C.; Shepherd, James J.; and Lyons, Thomas A., 3,721,097.
Coal Industry (Patents) Limited: *See—*
Hughes, David Emrys; and Davies, Donald, 3,721,378.
Cocks, Franklin H.: *See—*
Entine, Gerald; Cocks, Franklin H.; and Mitchell, Carl Rice, 3,721,938.
Coddington, Carl D.: *See—*
Lewis, Charles A.; Homza, John; Volkmer, Eldon A.; Kalaf, George P.; Coddington, Carl D.; and Zablocki, Charles J., 3,721,190.
Codina, Jorge G., to Gravimetrics Incorporated. Magnetometer employing magnetically suspended body. 3,721,984, Cl. 324-43.00r.
Coffin, Stewart T. Assembly puzzle. 3,721,448, Cl. 273-160.000.
Cohen, Andrew R.: *See—*
Newman, Walter C.; and Cohen, Andrew R., 3,721,905.
Cohen, Howard. Orthodontic bracket. 3,721,005, Cl. 32-14.00a.
Cohen, Sheppard, to GTE Sylvania Incorporated. Sodium vapor lamp having improved starting means including a heater. 3,721,846, Cl. 313-15.000.
Coilcraft, Inc.: *See—*
Renskers, John O., 3,721,747.
Colburn, Lyle W., to Dow Chemical Company, The. Bonding metal laminae with thermoplastic film. 3,721,597, Cl. 156-309.000.
Collie, Stafford D., to Phillips Petroleum Company. Readily openable foamed polymer container. 3,721,360, Cl. 215-32.000.
Collins, Paul R. Fish hook remover. 3,721,034, Cl. 43-53.500.
Collins Radio Company: *See—*
George, Robert A., 3,721,959.
Collins, William Joseph: *See—*
Feldner, John Edward; and Collins, William Joseph, 3,721,875.
Collision Devices, Inc.: *See—*
Sobel, Leonard H., 3,721,433.
Columbia Broadcasting System, Inc.: *See—*
Ettlinger, Adrian B., 3,721,757.
Comley, William, to McDonnell Douglas Corporation. Display generating means creating isometric projections of a family of curves. 3,721,855, Cl. 315-22.000.
Commissariat a l'Energie Atomique: *See—*
Gallay, Jean-Jacques; Helary, Jean-Louis; and Jurien de la Graviere, Marcel (said Helary and said Jurien de la Graviere assor. to), 3,721,549.
Commonwealth of Puerto Rico, Government of the: *See—*
Rand, Sidney, 3,721,048.
Communications Patents Limited: *See—*
Gabriel, Ralph Parton; and Kinross, Rupert Ivor, 3,721,929.
Compagnie Nationale d'Amenagemt de la Region du Bas-Rhode Languedoc: *See—*
Rutten, Pierre L., 3,721,254.
Conco Inc.: *See—*
Goudreau, Noel G., 3,721,416.
Condon, Richard D.; Gill, Harry A.; Noonan, David J.; and Paul, Gerard T., to Perkin-Elmer Corporation, The. Analytical instrument system. 3,721,813, Cl. 235-151.350.
Conographic Corporation: *See—*
Villalobos, Luis F.; Harano, Allen A.; and Breinlinger, Richard H., 3,721,810.
Conseiller, Yvon G. M.; and Fontaine, Gerrard J., to Rhone-Poulenc S.A. Process for the nitrosylation of organic compounds. 3,721,669, Cl. 260-248.500.
Consiglio Nazionale delle Ricerche: *See—*
D'Addea, Nunzio; Panzeri, Cesare; and Chiappulini, Ruggero, 3,721,158.
Constructions Mills-K: *See—*
Bussienne, Christian Edmond, 3,721,326.
Container Corporation of America: *See—*
Austin, Timothy K., 3,721,029.
Conti, Robert F.; and Follett, Don S., to Follett Corporation. Ice storage and water carbonating system. 3,721,369, Cl. 222-67.000.
Continental Machines, Inc.: *See—*
Robinson, La Roy E.; and Peltz, Leslie J., 3,721,139.
Contratto, James, to U.S. Industries, Inc. Recessed lighting fixture. 3,721,817, Cl. 240-73.0ba.
Conway, Gerard V., to General Electric Company. Lock plate for high voltage bushings with removable connectors. 3,721,942, Cl. 339-75.00r.
Cook, Donald L.; and Hansen, Douglas R. Toy figure with mechanism for flowing air. 3,721,039, Cl. 46-116.000.
Cook, James E.: *See—*
Michel, Donald E.; Fairbairn, Le Roy W.; and Cook, James E., 3,721,940.
Cook, Robert L. Means for supporting tools. 3,721,348, Cl. 211-60.00t.
Cooper, Jerry W.; Williams, Leland E.; Haley, John S.; and Ensley, Rufus N., to Dayco Corporation. Endless track. 3,721,477, Cl. 305-38.000.
Coradi, G., A.G.: *See—*
Blattner, Karl; and Picard, Roland, 3,721,164.
Corbett, William George; and Clegg, Michael Ward. Permafrost oil-production method. 3,721,298, Cl. 166-302.000.
Corderman, Sidney A., to McIntosh Laboratory, Inc. Equalization system. 3,721,861, Cl. 317-16.000.
Corey, Lawrence G.; and Opalenik, John J., to Arrow-Hart, Inc. Power control for portable electric tool. 3,721,879, Cl. 318-345.000.
Cornell Research Foundation, Inc.: *See—*
Steinkraus, Keith H., 3,721,569.
Corsaro, Vincent A., to Western Electric Company, Incorporated. Apparatus for treating articles with a liquid. 3,721,379, Cl. 228-39.000.
Corwith, James: *See—*
Howell, Elvin L.; and Corwith, James, 3,721,359.
Cory, Victor N. Preservation of olives. 3,721,572, Cl. 99-197.000.
Coughlin, Donald W. Combination shut-off check and pressure surge relief valve. 3,721,264, Cl. 137-596.200.
Council Commerce Corporation, mesne: *See—*
Crosby, Philip C.; Goyette, Robert J.; and Bauer, Douglas M., 3,721,001.
Countryman, Albert J., to Ty-Lok Assembly Systems, Inc. Strapping fastener. 3,721,750, Cl. 174-135.000.
Coursen, David L.: *See—*
Bergmann, Oswald R.; and Coursen, David L., 3,721,471.
Cowdrey, Roy M., to Singer Company, The. Necktie and method of making same. 3,720,958, Cl. 2-146.000.
Craig, Philip V. C., to Telemation, Inc. Color television encoder modulator. 3,721,755, Cl. 178-5.40r.
Cramer Industries, Inc.: *See—*
Wehner, Norvin J., 3,721,315.
Crane, Glen Robert: *See—*
Bergman, John George, Jr.; Crane, Glen Robert; and McFee, James Hoffman, 3,721,831.
Cranston, Benjamin Howell. Explosive bonding of workpieces to manufacture a capacitor. 3,720,986, Cl. 29-25.420.
Crawford, Donald G.; and Nack, Michael R., to FMC Corporation. Article timing and feeding machanism. 3,721,330, Cl. 198-34.000.
Crisafulli, Angelo J. Vertically adjustable centrifugal pump for use in manholes. 3,721,504, Cl. 415-74.000.
Crisfino, Daniel P. Rotary cutter apparatus for roofing material. 3,721,470, Cl. 299-39.000.
Critser, Jack W., to Instronics Ltd. Line following apparatus. 3,721,881, Cl. 318-568.000.
Croisettere, Joseph R. Marcel, to Northern Electric Company, Limited. Method and apparatus for strand winding and reeling. 3,721,393, Cl. 242-25.00a.
Crook, Benjamin, & Sons Limited: *See—*
Crook, John Michael, 3,721,591.
Crook, John Michael, to Crook, Benjamin, & Sons Limited. Method of making inflatable balls. 3,721,591, Cl. 156-93.000.
Crosby, Philip C.; Goyette, Robert J.; and Bauer, Douglas M., to Council Commerce Corporation, mesne. Method of making quick responding thermometer. 3,721,001, Cl. 29-612.000.
Cryogenic Technology Inc.: *See—*
Sheppard, John C.; and Hosmer, Thomas P., 3,721,101.
Csaki, Joachim, to Ackermann u. Schmitt KG. Mechanism for fastening a saw blade. 3,721,142, Cl. 143-156.00r.
Cunningham, Eldon R., to General Electric Company. Resilient motor mounting arrangement. 3,721,411, Cl. 248-26.000.
Curr, Maurice D., to Deutsch Company Electronic Components Division, The. Electrical connecting device. 3,721,943, Cl. 339-94.00m.
Cuscurida, Michael: *See—*
Moss, Philip Hotchkiss; and Cuscurida, Michael, 3,721,665.
Cutler-Hammer, Inc.: *See—*
Hults, Harold W., 3,721,945.
D'Addea, Nunzio; Panzeri, Cesare; and Chiappulini, Ruggero, to Consiglio Nazionale delle Ricerche. Electro hydraulic motors. 3,721,158, Cl. 91-35.000.
Dailey, C. Lee: *See—*
Witte, Robert S.; Dailey, C. Lee; Eck, Milford J.; and Rutherford, Walter H., 3,721,916.
Dannebert, Peter: *See—*
Weber, Karl-Heinz; Zeile, Karl; Dannebert, Peter; Giesemann, Rolf; Bauer, Adolf; Merz, Herbert; and Kuhn, Franz Josef, 3,721,666.
Dappen, Glen M.: *See—*
Becker, Richard W.; and Dappen, Glen M., 3,721,555.
Darboven, Ernest F., to Singer Company, The. Image beam lock-on detector. 3,721,977, Cl. 343-7.00a.
Dargent, Bruno M., to Hamilton Watch Company. Solid state watch incorporating large-scale integrated circuits. 3,721,084, Cl. 58-50.00r.
Darlington, Walter A.; and Chupp, John P., to Monsanto Company. 2,5'-Dihalo-3-tert alkyl-5-nitrosalicylanilides for combatting lepidoptera cheiving larval. 3,721,737, Cl. 424-230.000.
Darnell, Byron G.: *See—*
Parks, Argus F.; and Darnell, Byron G., 3,721,745.
Dart Industries, Inc.: *See—*
Fein, Marvin Michael; and Roderick, John James, 3,721,693.
D'Atabekian, Michel. Continuous fringe for making hairpieces or the like. 3,721,464, Cl. 289-1.500.
Datagraph AG: *See—*
Sandt, Gerhardt; and Ostermeier, Heinrich, 3,721,342.
Davies, Donald: *See—*
Hughes, David Emrys; and Davies, Donald, 3,721,378.
Davis, William F., to Motorola, Inc. Stable current reference circuit with beta compensation. 3,721,893, Cl. 323-4.000.

Dawson, Jack C.: *See—*
Hamann, Victoria; and Dawson, Jack C., 3,721,956.

Day, William B., to Sperry Rand Corporation. High frequency mixer and modular replaceable element therefor. 3,721,903, Cl. 325-445.000.

Dayco Corporation: *See—*
Cooper, Jerry W.; Williams, Leland E.; Haley, John S.; and Ensley, Rufus N., 3,721,477.

De Boer, Henri G. J.: *See—*
Tellier, Jacque C. T.; and De Boer, Henri G. J., 3,721,552.

De Haes, Louis Maria; Gevers, Hugo Karel; and VanHeertum, Johannes Josephus, to Agfa-Gevaert N.V. Photographic material for the preparation of printing plates. 3,721,559, Cl. 96-33.000.

De Santis, Michael J.; Page, Robert H.; and Rakowsky, Edward L., to Singer Company, The, mesne. Electro-fluidic signal converter. 3,721,257, Cl. 137-828.000.

De Werdt, Reinier, to U.S. Philips Corporation. Etching method employing an etching mask while suppressing underetching. 3,721,592, Cl. 156-11.000.

De Wiant Corporation, mesne: *See—*
Kubick, Richard J., 3,721,534.

Debs, Victor, to Levolor Lorentzen, Inc. Method of making a venetian-blind installation. 3,721,285, Cl. 160-166.000.

Deckert, Albert V., Jr.; and Brinkmann, Frederick J., to Associated Ideas International, Inc., mesne. Soft support system for hulls and the like. 3,721,096, Cl. 61-66.000.

Dee, William C., to Aerostatic Limited. Gas bearing assembly. 3,721,480, Cl. 308-9.000.

Deere & Company: *See—*
Behrens, Robert Nick, 3,721,076.
Buchmuller, Josef; and Hartlieb, Otto, 3,721,302.
Burrough, Donald E.; Steuerwald, Wilfred Lee Roy; and Sawyer, Bobby Gene, 3,721,079.
French, John Lischer; Kessler, Kenneth Quentin; Funk, Welker W.; Pierrot, Victor Charles, III; and Hiseler, Stanley Robert, 3,721,280.
Hanser, Paul Edmund, 3,721,303.
Kittle, Carl Edwin, 3,721,160.
Nelsen, Arlyn Ray; and Meiers, Gerald Franklyn, 3,721,461.

Deering Milliken Research Corporation: *See—*
Addis, Kenneth J., 3,721,599.

Del Zotto, Giorgio, to Ates Componenti Elettronici S.p.A. Ignition circuit for spark plugs of internal-combustion engine. 3,721,224, Cl. 123-148.00e.

Delzenne, Gerard Albert: *See—*
Laridon, Urbain Leopold; Delzenne, Gerard Albert; and Peeters, Hugo Karel, 3,721,566.

Denkowski, Walter J., to Philadelphia Gear Corporation. Anti-backlash screw jack. 3,721,133, Cl. 74-441.000.

Deremiah, John F.; and Montgomery, Delmar L. Apparatus for supplying coolant liquid for refrigeration coils. 3,721,258, Cl. 137-111.000.

Design Center, Inc.: *See—*
Menkel, Gary G., 3,721,513.

Deutsch Company Electronic Components Division, The: *See—*
Curr, Maurice D., 3,721,943.

Deutsch, Marshall E.: *See—*
Mead, Louis W.; and Deutsch, Marshall E., 3,721,528.

Deutsche Babock & Wilcox Aktiengesellschaft: *See—*
Willach, Rudolf; and Rafael, Aruth, 3,721,217.

Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See—*
Schulte-Schrepping, Karl-Heinz; Kaufmann, Lothar; and Tilp, Paul, 3,721,729.

Dewey, David B., Jr.; and Schofield, Norman W., to General Dynamics Corporation. Reinforced wall structure. 3,721,058, Cl. 52-251.000.

Dexter, Martin, to Geigy Chemical Corporation. Esters of (dialkyl-4-hydroxy-phenyl)malonic acid and related compounds. 3,721,704, Cl. 260-473.00s.

Di Stefano, Alfred. Pizza pie warming carrier. 3,721,803, Cl. 219-387.000.

Diamond Shamrock Corporation: *See—*
Schalin, Edmund; Dietrich, Joseph J.; Sturm, Clarence L.; Berkey, Reynold A.; and Semancik, John R., 3,721,642.

Dick, Rudolf, to Golterman, Wandel u. Switching system for plural projection of traces on screen of single-beam cathode-ray tube. 3,721,856, Cl. 315-25.000.

Dickakian, Ghazi Mourad, to Esso Research and Engineering Company. Method of preparing high softening point thermoplastics. 3,721,658, Cl. 260-82.000.

Dickstein, Jack: *See—*
Makower, Samuel J.; Cautilli, Philip A.; and Dickstein, Jack, 3,721,636.

Dictron International Corporation: *See—*
Ho, Charles W., 3,721,765.

Diem, Albert R. Silicon coated substrates and objects fabricated therefrom. 3,721,584, Cl. 117-212.000.

Dietrich, Joseph J.: *See—*
Schalin, Edmund; Dietrich, Joseph J.; Sturm, Clarence L.; Berkey, Reynold A.; and Semancik, John R., 3,721,642.

Dillman, Thayer L.: *See—*
Spisak, Andrew J.; and Dillman, Thayer L., 3,721,843.

Dimmick, Roger F.; Lagergren, Richard E.; Markley, Robert F.; Ricklefs, Merlin J.; and Schaffer, Walter S., to International Business Machines Corporation. Pneumatic document card reader. 3,721,808, Cl. 235-61.11j.

Dimond, Harold L. Teaching aid. 3,721,151, Cl. 84-398.000.

Dittrich, Volker: *See—*
Rohr, Otto; Ebner, Ludwig; Dittrich, Volker; and Siegle, Heinz, 3,721,741.

Diversified Packaging, Incorporated: *See—*
Hannon, James V., 3,721,336.

Dixon, John Nigel: *See—*
Wyness, Keith Gordon; Dodd, Alan Roy; Dixon, John Nigel; and Kearney, Kevin David Nicholas, 3,720,971.

Dixon, Robert P., to General Electric Company. Testing arrangement for a data communication system. 3,721,958, Cl. 340-146.1ba.

Dodd, Alan Roy: *See—*
Wyness, Keith Gordon; Dodd, Alan Roy; Dixon, John Nigel; and Kearney, Kevin David Nicholas, 3,720,971.

Dodsworth, Alfred Manston Heeley, to Clarkson, W. J., Limited. Method of, and apparatus for, stitching together two layers of material. 3,721,202, Cl. 112-121.150.

Dodt, Johann: *See—*
List, Ferdinand; Dodt, Johann; and Alfs, Helmut, 3,721,708.

Doggett, John G., Jr., to Motorola, Inc. Adaptive radar clutter rejection. 3,721,978, Cl. 343-7.00a.

Dolveck, Gilbert, to Aluminium Suisse S.A. Dispensing container. 3,721,371, Cl. 222-386.500.

Dominguez-Burguette, Mario, to Minnesota Mining and Manufacturing Company. Phtalein-flvoran semiconductive polymers. 3,721,649, Cl. 260-47.00c.

Domres, Franklin W. Pulp cutting and loading machine. 3,721,143, Cl. 143-46.00r.

Donaldson, Fred A. Speed control system for motor vehicles. 3,721,309, Cl. 180-105.00r.

Dow Chemical Company: *See—*
Merrill, Claude I., 3,721,695.

Dow Chemical Company, The: *See—*
Colburn, Lyle W., 3,721,597.
Goodenough, Robert D., 3,721,629.
Merrill, Claude I., 3,721,694.
Reding, John T.; and Barnett, David W., 3,721,618.
Tolkmith, Henry; Seiber, James N.; and Budde, Paul B., 3,721,677.

Downey, Rogers B., to Polaroid Corporation. System for processing a strip of photographic material. 3,721,491, Cl. 352-72.000.

Dragoumis, Paul; and Grimes, Arthur Stirling. Apparatus for detecting leakage from or rupture of pipes and other vessels containing fluid under pressure. 3,721,898, Cl. 324-65.00r.

Drake, Gene F. Fluid separation and method and apparatus for forming same. 3,721,596, Cl. 156-181.000.

Draudt, Carl W., Jr.: *See—*
Lore, Raymond J.; and Draudt, Carl W., Jr., 3,721,346.

Dresser Industries, Inc.: *See—*
Sartor, Raymond Watkins, 3,721,306.

Drew, Gene R.; and Layman, Bobby C., to United States of America, Navy. Variable mode sling for helicopter recovery systems. 3,721,408, Cl. 244-139.000.

Drew, William G. Lid unscrambler having rotationally reciprocating gate. 3,721,328, Cl. 198-29.000.

Driall Driers, Inc.: *See—*
Applegate, Robert D., 3,721,179.

Drukker, D., & Zn. N.V.: *See—*
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Du Pont de Nemours, E. I., and Company: *See—*
Bergmann, Oswald R.; and Coursen, David L., 3,721,471.
Briggs, Angelis R.; and Maxwell, Thomas J., 3,721,725.
Hovsepian, Boghos Karnig, 3,721,113.
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Dubendorff, Joachim: *See—*
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Dubinsky, Rudolf Solomonovich: *See—*
Paton, Boris Evgenievich; Medovar, Izrailevich Boris; Latash, Jury Vadimovich; Chekotilo, Leonty Vasilievich; Baglai, Vitaly Mikhailovich; Artamonov, Viktor Leonidovich; Garkaljuk, Rodimir Ivanovich; Timchenko, Viktor Anatolievich; Malichekno, Evgeny Fedorvich; Stupak, Leonid Mikhailovich; and Dubinsky, Rudolf Solomonovich, 3,721,286.

Dubost, Jacques Leon Francois, to R. K. S. Process for the manufacture of slewing rings or bearing assemblies. 3,720,987, Cl. 29-148.40r.

Dufes, Bernard, to Altec-Sopitec S.A. Packaging assembly of heat-sealable film material. 3,721,383, Cl. 229-63.000.

Dunlea, John V., Jr. Method of disposing bulk rubbish. 3,721,183, Cl. 100-39.000.

Dunn, Cletus M., to United States of America, Navy. Auditory test facility with multistage single sideband heterodyning. 3,721,764, Cl. 179-1.00n.

Dunn, Elman R., to Litton Industries, Inc. Horizontal disc grinder with equal feed control from workpiece contact. 3,721,046, Cl. 51-118.000.

Dupont, Peter: *See—*
Forg, Wolfgang; and Dupont, Peter, 3,721,098.

Duryea, Daniel F.: *See—*
Hughes, John H.; and Duryea, Daniel F., 3,721,197.

Dvorak, Joseph E.; and Wallace, John F., to Cleveland Flux Company. Method of fluxing and fluidizing slag in a cupola. 3,721,547, Cl. 75-30.000.

Earp, Charles William; and Brandon, Martin, to International Standard Electric Corporation. Signal tapering at receiver. 3,721,987, Cl. 343-113.0de.

Eastman Kodak Company: *See—*
Abbott, Thomas I., 3,721,558.
Becker, Richard W.; and Dappen, Glen M., 3,721,555.
Ewald, William P.; and Metzger, Lenard M., 3,721,761.
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Kern, Frederick W., 3,721,171.

Ebner, Ludwig: *See—*
Rohr, Otto; Ebner, Ludwig; Dittrich, Volker; and Siegle, Heinz, 3,721,741.

Eby, George W. Lamp mount for automotive vehicles. 3,721,374, Cl. 224-42.10b.

Eck, Milford J.: *See—*
Witte, Robert S.; Dailey, C. Lee; Eck, Milford J.; and Rutherford, Walter H., 3,721,916.

Eckardt, J. C., AG: *See—*
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Edge, James, to Welwyn Electric Limited. Capacitor. 3,721,870, Cl. 317-258.000.

Edling, Gustaf Emanuel, to Apparatkemiska AB AKA. Wall thickness and temperature monotoring apparatus for boiler tubes. 3,721,897, Cl. 324-64.000.

Edstrom, Gene H.; Elwell, Russell M.; and Irwin, John W., to International Business Machines Corporation. Data processing subsystems. 3,721,961, Cl. 340-172.500.

Eggert, Horst: *See—*
Picard, Karl Heinz; and Eggert, Horst, 3,721,785.

Egli, Werner Hans; and Severson, Asbjorn M., to Honeywell Inc. Liquid revolution counter for fuze arming. 3,721,195, Cl. 102-79.000.

Ehrig, Bodo; Muller, Erwin; and Mott, Ludwig, to Bayer Aktiengesellschaft. Radiation-crosslinkable polymers prepared from olefinically unsaturated monomers and vinylene carbonyl monomers. 3,721,648, Cl. 260-47.0ua.

Eisenwerke Kaiserslautern GmbH: *See—*
Gehlen, Hermann Walter; Hartmann, Karl; and Thieme, Gerhard, 3,720,980.

Eisler, Paul. Electrical heating film. 3,721,800, Cl. 219-213.000.

Elders, Gerald W.; Schneider, Thomas E.; and Alongi, John R., to Pin-Set Corporation. Apparatus for and method of setting pins in mine roofs. 3,721,094, Cl. 61-45.00b.

Electric Regulator Corporation: *See—*
Ettinger, James P.; and Otteson, Christian S., 3,721,890.

Electricite de France (Service National): *See—*
Brachet, Alain; and Lannou, Louis, 3,721,116.

Electro Corporation: *See—*
Gee, Gordon E., 3,721,968.

Electronic Removal of Metals, Inc.: *See—*
Lobur, Walter, 3,721,795.

Eliahou, Elie S.: *See—*
Tinch, David H.; Campbell, Raymond L., Jr.; Eliahou, Elie S.; and Schmidt, Arthur W., 3,721,960.

Elks, Joseph; Phillipps, Gordon Hanley; and May, Peter John, to Glaxo Laboratories Limited. 3-Keto-Δ4-9a-halo-1'-oxygenated-16-methyl or methylene-17d-acyloxy-20-keto-21-halo-pregnenes. 3,721,687, Cl. 260-397.450.

Elmaleh, Leonard R., to Scheiner, Solly. Manual suction corettage instruments. 3,721,244, Cl. 128-304.000.

Elwell, Russell M.: *See—*
Edstrom, Gene H.; Elwell, Russell M.; and Irwin, John W., 3,721,961.

Emerson Electric Co.: *See—*
Visos, Charles D.; Love, John J.; and Banes, Ralph E., 3,721,263.

Emhart Corporation: *See—*
Bystrianyk, Wasyl; and Sarkozy, Francis A., 3,721,544.

EMI Limited: *See—*
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Enenkel, Hans Joachim: *See—*
Muller-Calgan, Helmut; Unger, Richard; and Enenkel, Hans Joachim, 3,721,672.

Englert, Ralph A.; Fasano, Ronald F.; and Palmer, Darrell D., to International Business Machines Corporation. Head carriage assembly for magnetic disk storage drive. 3,721,967, Cl. 340-174.10c.

Ennis, George Thomas. Vehicle wrap-around cleaning apparatus. 3,720,972, Cl. 15-21.00d.

Ensley, Rufus N.: *See—*
Cooper, Jerry W.; Williams, Leland E.; Haley, John S.; and Ensley, Rufus N., 3,721,477.

Entine, Gerald; Cocks, Franklin H.; and Mitchell, Carl Rice, to Tyco Laboratories Incorporated. Cadmium telluride devices with non-diffusing contacts. 3,721,938, Cl. 338-15.000.

Erdmann, Otto: *See—*
Kruse, Friedel; Wahle, Gunter; Erdmann, Otto; and Rudszinat, Willy, 3,721,340.

Erickson, Dennis E., to Clark Equipment Company. Combined battery case, counterweight and overhead guard. 3,721,353, Cl. 214-38.0ca.

Erlich, Giora; and Lerner, Marc. Multiport valve with rotatable cover. 3,721,268, Cl. 137-625.460.

Erste Deutsche Floatglas GmbH & Co. OHG: *See—*
Classen, Franz; and Parrot, Jean-Marc, 3,721,543.

ESB Incorporated: *See—*
Prince, Jack M., 3,721,490.

Esco Manufacturing Company: *See—*
Parks, Argus F.; and Darnell, Byron G., 3,721,745.

Esso Research and Engineering Company: *See—*
Beals, Charles D.; Fitzpatrick, George I.; and O'Hara, Kim L., 3,721,126.
Dickakian, Ghazi Mourad, 3,721,658.
Foroulis, Zisis Andrew; and Hopkinson, Brian Eric, 3,721,526.
Maravetz, Lester L., 3,721,711.
Stogryn, Eugene L.; Berger, Joel G.; and Bosniack, David S., 3,721,698.

Ettinger, James P.; and Otteson, Christian S., to Electric Regulator Corporation. Power supply for A.C. and D.C. drive. 3,721,890, Cl. 321-8.00r.

Ettlinger, Adrian B., to Columbia Broadcasting System, Inc. Method and apparatus for automatically editing television information. 3,721,757, Cl. 178-6.60a.

Etzbach, Volker: *See—*
Forg, Wolfgang; and Etzbach, Volker, 3,721,099.

Evans, Morton I.: *See—*
Brown, Victor E.; Mora, Paul L.; and Evans, Morton I., 3,720,995.

Evans, Robert J. Self-locking fastener. 3,721,283, Cl. 151-22.000.

Ewald, William P.; and Metzger, Lenard M., to Eastman Kodak Company. Optical-to-electrical signal transducer apparatus. 3,721,761, Cl. 178-7.880.

Fa. Grunzweig & Hartmann AG: *See—*
Wesch, Ludwig, 3,721,982.

Fabriques de Produits Chemiques de Tham et de Mulhouse: *See—*
Bardinet, Guy Marie Paul, 3,721,689.

Fabwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning: *See—*
Hoffmann, Dieter; and Stach, Hans, 3,721,706.

Fackler, Chester M.; and Lenderking, David H., to International Business Machines Corporation. Record medium driving arrangements for sound transducing apparatus. 3,721,451, Cl. 274-4.00j.

Fairbairn, Le Roy W.: *See—*
Michel, Donald E.; Fairbairn, Le Roy W.; and Cook, James E., 3,721,940.

Fairchild Industries, Inc.: *See—*
Clarke, James A., 3,721,407.
Kramer, Stanley I., 3,721,986.

Falterman, Charles W.; Griffith, William J.; and Fletcher, Perry L., to United States of America, Navy. Underwater repeating shotgun. 3,721,031, Cl. 42-1.001.

Farber, Sheldon; and Wright, Arthur John, to National Cash Register Company, The. Mark forming record materials and process for their use. 3,721,576, Cl. 117-36.200.

Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning: *See—*
Hortig, Hans-Peter; and Schutz, Karl-Friedrich, 3,721,525.
Nahm, Helmut; and Siedel, Water, 3,721,703.
Schuierer, Erich; and Hoffmann, Dieter, 3,721,700.
Von Der Eltz, Hans-Ulrich; Gross, Richard; and Birke, Walter, 3,721,524.

Farkas, Elizabeth H.: *See—*
Glicksman, Martin; and Farkas, Elizabeth H., 3,721,571.

Farmer, Charles G.; and Loyd, Calvin D., to Caterpillar Tractor Company. Friction welding method. 3,720,993, Cl. 29-470.300.

Farrissey, William J., Jr.: *See—*
Abbate, Franklin W.; and Farrissey, William J., Jr., 3,721,674.

Fasano, Ronald F.: *See—*
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Federal Paper Board Company, Inc.: *See—*
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Arneson, Edwin L., 3,721,368.

Fedock, Michael P.: *See—*
Hodge, Abram L.; and Fedock, Michael P., 3,721,548.

Fein, Marvin Michael; and Roderick, John James, to Dart Industries, Inc. Metal halide-ester reaction process and compositions. 3,721,693, Cl. 260-448.00r.

Feldman, Rubin, to Tsi, Inc. Apparatus for sealing and shrinking plastic film. 3,721,804, Cl. 219-388.000.

Feldner, John Edward; and Collins, William Joseph, to Oster Corporation. Dual cycle blender control means. 3,721,875, Cl. 318-245.000.

Fellows, Charles T.; and Hermann, Stanley R., to National Cash Register Company, The. Transfer medium for producing scratch and smudge resistant marks and a process for making the same. 3,721,635, Cl. 260-28.50a.

Fenton, Donald M., to Union Oil Company of California. Decomposition of carbonates to form aldehydes. 3,721,714, Cl. 260-601.000r.

Fenton, Donald M., to Union Oil Company of California. Alkylation of condensed ring arylols. 3,721,715, Cl. 260-624.00c.

Ferguson, Archibald McIntyre, to University Court of the University of Glasgow, The. Navigational instruments for ships. 3,721,951, Cl. 340-3.000.

Fernald, Herbert B.; Hillier, Donald E., Jr.; Hughes, Charles F., Jr.; and Strausser, John R., to Gulf Research & Development Company. Process for converting ethylene to normal alpha olefins. 3,721,719, Cl. 260-683.15d.

Ferri, John L.: *See—*
Mehalchick, Emil J.; Mathers, James E.; and Ferri, John L., 3,721,630.

Few, Robert A.: *See—*
Bice, Charles D.; Senchur, Frank W.; and Few, Robert A., 3,721,790.

Fieldcrest Mills, Inc.: *See—*
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Sherrill, Ernest Kohn; and Taylor, John Paul, 3,721,273.
Sherrill, Ernest Kohn; and Taylor, John Paul, 3,721,274.

Fierfort, Claude, to Schlumberger Technology Corporation. Methods and apparatus for investigating multiphasic well fluids. 3,721,121, Cl. 73-155.000.

Fierstien, Gary N.; and Jacobs, Paul H., to Motorola, Inc. Broadband radio frequency ferrite transformer providing close coupling. 3,721,932, Cl. 336-65.000.

Fife Corporation: *See—*
Chenot, Louis A., 3,721,481.

Finn, Robert K.; and Tannahill, Alex L. Process for the bio-oxidation of nitrogen deficient waste materials. 3,721,622, Cl. 210-11.000.

Fisch, Richard; and Newman, Norman, to Minnesota Mining and Manufacturing Company. Process for treating waste effluent. 3,721,624, Cl. 210-47.000.

Fisch, Richard S.; Newman, Norman St. Paul; and Bexell, Joel L., to Minnesota Mining and Manufacturing Company. Photographic developer concentrate. 3,721,563, Cl. 96-66.100.

Fischer, Georg, Aktiengesellschaft: *See—*
Buhrer, Erwin; and Alt, Anton, 3,721,432.

Fischer, Werner; and Schmitt, Felix, to Th. Goldschmidt A.G. Process of separating yttrium from lanthanides. 3,721,692, Cl. 260-429.200.

Fisher, Viktor Davydovich: *See—*
Sereda, Nikolai Ivanovich; Sysun, Viktor Viktorovich; Skvortsov, Boris Vasilievich; Fisher, Viktor Davydovich; and Tolstoshev, Alexandr Vasilievich, 3,721,917.

Fitzgerald, Maurice J., to Polaroid Corporation. Polymeric binders for photographic emulsions. 3,721,565, Cl. 96-114.000.

Fitzpatrick, George I.: *See—*
Beals, Charles D.; Fitzpatrick, George I.; and O'Hara, Kim L., 3,721,126.

Fitzsimons, Alan R.: *See—*
Mazac, Frank P.; and Fitzsimons, Alan R., 3,721,768.

Fix, Delbert D., to Eastman Kodak Company. Diffusion transfer reception elements, film units and processes therefor. 3,721,556, Cl. 96-3.000.

Flamand, Jean: *See—*
Pieuchard, Guy; Flamand, Jean; and Labeyrie, Antoine, 3,721,487.

Flechet, Jean: *See—*
Machon, Raymond; Flechet, Jean; and Hugo, Etienne, 3,721,522.

Fletcher, John Karl: *See—*
Turner, Harold Dale; and Fletcher, John Karl, 3,721,329.

Fletcher, Perry L.: *See—*
Falterman, Charles W.; Griffith, William J.; and Fletcher, Perry L., 3,721,031.

Fletcher, Robert W., to Standard Oil Company. Stackable containers. 3,721,367, Cl. 220-97.00c.

Flumm, Paul T., to Robertshaw Controls Company. Digital clock and method of operation and making the same. 3,721,086, Cl. 58-125.00c.

FMC Corporation: *See—*
Crawford, Donald G.; and Nack, Michael R., 3,721,330.
Hoffland, Joseph V., 3,721,265.
Matter, Theodore S.; and Mc Master, James E., 3,721,582.
Nephew, Oliver T., 3,721,350.
Saller, Erik; and Trechock, Jack, 3,721,608.

Fogel, Howard J.: *See—*
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Follett Corporation: *See—*
Conti, Robert F.; and Follett, Don S., 3,721,369.

Follett, Don S.: *See—*
Conti, Robert F.; and Follett, Don S., 3,721,369.

Folz, Sylvester D., to Upjohn Company, The. Anthelmintic method and formulations employing phenylhydroazone derivatives. 3,721,740, Cl. 424-327.000.

Folz, Sylvester D., to Upjohn Company, The. Anthelmintic method and formulations employing phenylhydrazone derivatives. 3,721,742, Cl. 424-327.000.

Fong, William, to National Research Development Corporation. Reluctance motors. 3,721,844, Cl. 310-166.000.

Fontaine, Gerrard J.: *See—*
Conseiller, Yvon G. M.; and Fontaine, Gerrard J., 3,721,669.

Fontanel, Andre; and Grau, Gerard, to Institut Francais du Petrole des Carburants et Lubrifiants. Method for surfaces exploration adapted in particular to seismic prospecting and device therefor. 3,721,954, Cl. 340-15.5tc.

Ford, Brian; and Clapp, Malcolm, to British Aircraft Corporation (A.T.) Limited, mesne. Sighting means for missiles. 3,721,420, Cl. 244-3.110.

Ford, Charles R.; and Percifield, Edward K., to Carlisle Corporation. Method and apparatus for detecting leaks in pneumatic wheels. 3,721,117, Cl. 73-40.700.

Ford, Clyde G.: *See—*
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Foremont McKesson, Inc.: *See—*
Francis, Leo H.; and Pollard, Henry L., 3,721,585.

Forg, Wolfgang; and Dupont, Peter, to Linde Aktiengesellschaft. Cooling by mixing gaseous streams. 3,721,098, Cl. 62-17.000.

Forg, Wolfgang; and Etzbach, Volker, to Linde Aktiengesellschaft. Fractional condensation of natural gas. 3,721,099, Cl. 62-29.000.

Fork, Frank W., to Robertson, H. H., Company. Bottomless sub-assembly for producing an underfloor electrical cable trench. 3,721,051, Cl. 52-173.000.

Foroulis, Zisis Andrew; and Hopkinson, Brian Eric, to Esso Research and Engineering Company. Inhibition of corrosion in hot carbonate carbon dioxide removal units. 3,721,526, Cl. 21-2.700.

Foster, John E.; and Koo, Tuh-Kai, to National Cash Register Company, The. Beam accessed MOS memory with beam reading, writing, and erasing. 3,721,962, Cl. 340-173.0cr.

Foty, James V.: *See—*
Bierwirth, Henry C.; and Foty, James V., 3,721,106.

Francis, Leo H.; and Pollard, Henry L., to Foremont McKesson, Inc. Method for manufacture of lactose. 3,721,585, Cl. 127-60.000.

Frank, Eugene P. Marker and tracking arm. 3,721,008, Cl. 33-41.00e.

Franklin, John Warrender, to Total (Power Hydraulics) Limited. Lift trucks. 3,721,318, Cl. 187-9.000.

Franks, Buyrl A., to Lowrance Electronics, Inc. Device for indicating the temperature and depth of water. 3,721,124, Cl. 73-344.000.

Fransson, Jan-Erik: *See—*
Malm, Assar; and Fransson, Jan-Erik, 3,720,998.

Fraser, Douglas S.; and Bender, Charles E., to Cenco Medical/Health Supply Corporation. Egg cutter. 3,721,181, Cl. 99-576.000.

Freeman, Leo B., Jr.: *See—*
Brickman, Norman F.; and Freeman, Leo B., Jr., 3,721,838.

Fremery, Max; Hover, Hermann; and Schwarzlose, Gert, to Union Rheinische Braunkohlen Kraftstaff Aktiengesellschaft. Process for the production of hydroquinone. 3,721,615, Cl. 204-73.00r.

French, Alfred W.; and Starrett, Forest J., Jr., to French Oil Mill Machinery Company. Mechanical screw press. 3,721,184, Cl. 100-117.000.

French, John Lischer; Kessler, Kenneth Quentin; Funk, Welker W.; Pierrot, Victor Charles, III; and Hiseler, Stanley Robert, to Deere & Company. Self-propelled tree delimber. 3,721,280, Cl. 144-2.00z.

French Oil Mill Machinery Company: *See—*
French, Alfred W.; and Starrett, Forest J., Jr., 3,721,184.

Frostad, Lars, to Rockwell Manufacturing Company. Movable blade guard and mounting for portable circular saws. 3,721,141, Cl. 143-159.00h.

Frungel, Frank; and Lohse, Horst, to Impulsphysik GmbH. Capping shutter with explosive charge of carbon powder. 3,721,172, Cl. 95-53.000.

Fugitt, Ronald Bruce, to United States of America, Navy. Instrument for measuring the depolarization of backscattered light. 3,721,500, Cl. 356-118.000.

Fujii, Mitsuharu: *See—*
Yokotsuka, Tamotsu; Iwaasa, Takashi; and Fujii, Mitsuharu, 3,721,606.

Fujii, Takayoshi: *See—*
Ueno, Saburo; Shimogo, Etsuzo; Kawasaki, Takao; Inmaru, Daisaku; Hirose, Fumio; Heya, Satoshi; Omura, Yoshio; Osaka, Yoshiaki; Fujii, Takayoshi; and Otake, Osamu, 3,721,667.

Fujimoto, Sakae; Kato, Saburo; Koizumi, Masami; and Sue, Takaji, said Koizumi and said Sue assors. to Kabushiki Kaisha. Device for transferring magnetic signals from a master sheet to magnetic sheets. 3,721,775, Cl. 179-100.20e.

Fujino, Masahiko; and Hatanaka, Chitoshi, to Takeda Chemical Industries, Ltd. Method for producing an active carboxylic acid ester. 3,721,662, Cl. 260-112.500.

Fujitsu Limited: *See—*
Ikebe, Yo; Ikebe, Jun; and Inaba, Seiuemon, 3,721,266.

Fukui, Saburo: *See—*
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French, John Lischer; Kessler, Kenneth Quentin; Funk, Welker W.; Pierrot, Victor Charles, III; and Hiseler, Stanley Robert, 3,721,280.

Furlow, Richard H.: *See—*
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Furumoto, Horace W.: *See—*
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Fuse, Yuzo: *See—*
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G-P Industries, Inc.: *See—*
Greenplate, Alvin E., 3,721,316.

Gabriel, Ralph Parton; and Kinross, Rupert Ivor, to Communications Patents Limited. Electrical switch devices. 3,721,929, Cl. 335-206.000.

GAF Corporation: *See—*
Tellier, Jacque C. T.; and De Boer, Henri G. J., 3,721,552.

Gaines, Lewis H.: *See—*
Jasinski, Raymond J.; and Gaines, Lewis H., 3,721,586.

Galen, Martin P.: *See—*
Hadtke, Frederick B.; and Galen, Martin P., 3,721,234.

Gallaro, Anthony V., to GTE Sylvania Incorporated. Dual persistence screen for a cathode ray tube. 3,721,849, Cl. 313-92.000.

Gallay, Jean-Jacques; deceased (by Gallay, Marielle; administratrix); Helary, Jean-Louis; and Jurien de la Graviere, Marcel, said Helary and said Jurien de la Graviere assor. to Commissariat a l'Energie Atomique. Preparation of metal ingots from the corresonding metal oxides. 3,721,549, Cl. 75-84.100.

Gallay, Marielle: *See—*
Gallay, Jean-Jacques; Helary, Jean-Louis; and Jurien de la Graviere, Marcel, 3,721,549.

Gamewell, Joseph M.: *See—*
Stockford, William F.; and Gamewell, Joseph M., 3,721,107.
Gamewell Mechanical Inc.: *See—*
Stockford, William F.; and Gamewell, Joseph M., 3,721,107.
Garate, Julian C.: *See—*
Tracy, Richard A.; and Garate, Julian C., 3,721,457.
Garcea, Giampaolo, to Alfa Romeo S.p.A. Diaphragm device, sensitive to absolute pressures. 3,721,127, Cl. 73-406.000.
Garcea, Giampaolo, to Alfa Romeo S.p.A. Variator for the setting of the camshafts of an internal combustion engine. 3,721,220, Cl. 123-90.150.
Gardberg-Medeiros Co.; d/b/a Magnetics Research Co.: *See—*
Medeiros, Joseph C., 3,721,450.
Gardner-Denver: *See—*
Hanson, Laurence B., 3,721,304.
Gardner-Denver Company: *See—*
Anderson, Theodore D.; and Harms, William J., 3,721,478.
Mayer, James R.; and Tipton, Joe D., 3,721,305.
Garkaljuk, Rodimir Ivanovich: *See—*
Paton, Boris Evgenievich; Medovar, Izrailevich Boris; Latash, Jury Vadimovich; Chekotilo, Leonty Vasilievich; Baglai, Vitaly Mikhailovich; Artamonov, Viktor Leonidovich; Garkaljuk, Rodimir Ivanovich; Timchenko, Viktor Anatolievich; Malichekno, Evgeny Fedorvich; Stupak, Leonid Mikhailovich; and Dubinsky, Rudolf Solomonovich, 3,721,286.
Skachko, Jury Nikolaevich; Moshkin, Venedikt Feofanovich; Garkaljuk, Rodimir Ivanovich; Popov, Nikolai Vladimirovich; Pofukhin, Valery Vasilievich; Korshunov, Igor Illarionovich; Bokov, Vladimir Mikhailovich; and Skorudsky, Boris Pavlovich, 3,721,793.
Garlaschi, Eufemia. Machine for the production of half-punched rivets. 3,720,968, Cl. 10-11.00a.
Garnett, Lawrence Taylor, to International Telephone and Telegraph Corporation. Fluid motor. 3,721,505, Cl. 415-53.000.
Garvey, Glenwood L. Self-cleaning restroom. 3,720,961, Cl. 4-1.000.
Gatco Rotary Bushing Company: *See—*
Johnson, Bernard H., 3,721,503.
Gatellet, Jacques: *See—*
Pelenc, Yves; and Gatellet, Jacques, 3,721,874.
Gattus, Jean; and Mallet, Maurice. Process for casting polyphenylene oxide film on stainless steel supports using a vegetable oil additive. 3,721,639, Cl. 260-18.0pf.
Gawehn, Karlfried: *See—*
Gruber, Wolfgang; Bergmeyer, Hans Ulrich; Werner, Wolfgang; Bernt, Erich; and Gawehn, Karlfried, 3,721,607.
Gay, Derek J.; and Smedley, William H., to Mattel, Inc. Retractable winding mechanism for elastic motors. 3,721,317, Cl. 185-39.000.
Gazeley, Keith Frederick: *See—*
Cain, Maurice Edward; Knight, Geoffrey Thomas; Gazeley, Keith Frederick; and Lewis, Peter McHigh, 3,721,659.
Gebauer & Griller, Firma: *See—*
Stoiber, Siegfried, 3,721,211.
Gee, Gordon E., to Electro Corporation. Magnetic pickup. 3,721,968, Cl. 340-195.000.
Gee, James M.: *See—*
Strandberg, Charles F., Jr.; Strandberg, Robert C.; and Gee, James M., 3,721,809.
Geesen, Michel Pierre Georges; and Laganier, Andre Pierre, to International Standard Electric Corporation. Coded pulse pair detector with improved detection probability. 3,721,906, Cl. 328-109.000.
Gehlen, Hermann Walter; Hartmann, Karl; and Thieme, Gerhard, to Eisenwerke Kaiserslautern GmbH. Pressing machine for forming elongated bodies of meat and the like edible material. 3,720,980, Cl. 17-32.000.
Geigy Chemical Corporation: *See—*
Dexter, Martin, 3,721,704.
Gele, Pierre; Laprade, Bernard; and Laprade, Xavier. Constant negative-pressure carburetors. 3,721,428, Cl. 261-23.00a.
General Dynamics Corporation: *See—*
Dewey, David B., Jr.; and Schofield, Norman W., 3,721,058.
General Electric Co.: *See—*
Caulier, Paul W.; and Greene, Donald W., 3,721,820.
General Electric Company: *See—*
Anderson, Bernard Joseph, 3,721,506.
Andrews, Charles Luther, 3,721,900.
Boyles, Robert L.; and Polonsky, Samuel, 3,721,087.
Brandt, George W.; and Hague, Joe T., 3,721,948.
Conway, Gerard V., 3,721,942.
Cunningham, Eldon R., 3,721,411.
Dixon, Robert P., 3,721,958.
Ham, Donald M., 3,721,901.
Hucko, Henry; and Lusignan, Henry T., 3,721,946.
Lee, Art, 3,721,832.
Rademaker, Leo C.; and Hill, Ezra C., 3,721,865.
Sisler, Robert R.; and Blake, Claude L., 3,721,015.
Smith, Edwin S., Jr., 3,721,868.
Trapani, Richard G.; and Rolnick, Benjamin, 3,721,837.
Trott, Gene F.; and Starita, Joseph M., 3,721,580.
Whitt, James A., 3,721,641.
General Motors Corporation: *See—*
Kelley, Oliver K., 3,721,135.
McDonald, Patrick G., 3,721,456.
George McCona L., to Bacon, Charles H., Company, mesne. Apparatus for measuring elastic fed to a sewing machine. 3,721,203, Cl. 112-121.260.
George, Robert A., to Collins Radio Company. Method and means for detecting error rate of transmitted data. 3,721,959, Cl. 340-146.1ax.
Gerber Products Company: *See—*
Brandt, Maurice W.; and Shears, Franklin J., 3,721,018.
Geren, Keith E.: *See—*
Hubbard, William C.; Geren, Keith E.; and Sauer, Warren A., 3,721,949.
Gerin, Merlin, Societe Anonyme: *See—*
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Germscheid, Hans Gunther: *See—*
Groschopp, Heinz; Schoenemann, Rudolf; Germscheid, Hans Gunther; and Venschott, Hubert, 3,721,614.
Gerrit, Verspui: *See—*
Knippenberg, Wilhelmus Franciscus; and Gerrit, Verspui, 3,721,732.
Gershen, Alvin E., Associates, Inc.: *See—*
Toan, Danforth W., 3,721,056.
Gevaert-Agfa N.V.: *See—*
Laridon, Urbain Leopold; Delzenne, Gerard Albert; and Peeters, Hugo Karel, 3,721,566.
Velter, Raphael Joris; and Meyer, Karl-Otto, 3,721,564.
Gevers, Hugo Karel: *See—*
De Haes, Louis Maria; Gevers, Hugo Karel; and VanHeertum, Johannes Josephus, 3,721,559.
Gewerkschaft Eisenhutte Westfalia: *See—*
Schwandt, Wolfgang, 3,721,159.
Geyser, Albert L., to Geyser, E. K., Company. Adjustable joint between panel frames. 3,721,053, Cl. 52-82.000.
Geyser, E. K., Company: *See—*
Geyser, Albert L., 3,721,053.
Giaimo, Edward Charles, Jr., to RCA Corporation. Method of transferring magnetic toner particles in an image configuration and apparatus therefor. 3,721,553, Cl. 96-1.400.
Gibson, John James; and Peterson, Donald William, to RCA Corporation. Physically small combined loop and dipole all channel television antenna system. 3,721,990, Cl. 343-726.000.
Giesemann, Rolf: *See—*
Weber, Karl-Heinz; Zeile, Karl; Dannebert, Peter; Giesemann, Rolf; Bauer, Adolf; Merz, Herbert; and Kuhn, Franz Josef, 3,721,666.
Gigoux, Claude R.; and Putz, Antide, to Thomson-CSF. Method of making magnetic circuit elements. 3,721,612, Cl. 204-15.000.
Gilbert, William W. Rotor apex seal damping device. 3,721,510, Cl. 418-113.000.
Gill, Harry A.: *See—*
Condon, Richard D.; Gill, Harry A.; Noonan, David J.; and Paul, Gerard T., 3,721,813.
Giller, William Leslie. Electric lamps. 3,721,850, Cl. 313-114.000.
Gillis, Marina N.: *See—*
Mazzeo, Michael P.; Gobran, Riad H.; Santaniello, Anthony F.; and Gillis, Marina N., 3,721,647.
Gjovik, James R.: *See—*
Brandli, Ronald I.; and Gjovik, James R., 3,721,308.
Glaxo Laboratories Limited: *See—*
Elks, Joseph; Phillipps, Gordon Hanley; and May, Peter John, 3,721,687.
Glicksman, Martin; and Farkas, Elizabeth H. Pudding compositions. 3,721,571, Cl. 99-139.000.
Gobran, Riad H.: *See—*
Mazzeo, Michael P.; Gobran, Riad H.; Santaniello, Anthony F.; and Gillis, Marina N., 3,721,647.
Goldfarb, Adolph E.: *See—*
Goldfarb, Adolph E.; and Strader, George C. (said Strader assor. to said), 3,721,442.
Goldfarb, Adolph E. Vehicle loading toy. 3,721,035, Cl. 46-40.000.
Goldfarb, Adolph E. Slide toy. 3,721,036, Cl. 46-43.000.
Goldfarb, Adolph E. Mechanical doll. 3,721,040, Cl. 46-119.000.
Goldfarb, Adolph E. Jump rope toy. 3,721,041, Cl. 46-119.000.
Goldfarb, Adolph E.; and Strader, George C., said Strader assor. to said Goldfarb, Adolph E. Target and magnetically releasable projectile. 3,721,442, Cl. 273-101.000.
Goldfarb, Irving: *See—*
Lippe, Joan M.; Goldfarb, Irving; and Jablon, Harry, 3,721,216.
Golterman, Wandel u.: *See—*
Dick, Rudolf, 3,721,856.
Goodenough, Robert D., to Dow Chemical Company, The. Method and composition for removing iron stains from porcelain. 3,721,629, Cl. 252-105.000.
Gooding, Gale A., to Johnson Plastic Corporation. Electrical raceway and decorative molding. 3,721,762, Cl. 174-48-.
Gordon, David A.: *See—*
Schlumbom, Peter; and Gordon, David A., 3,721,654.
Schlumbom, Peter; and Gordon, David A., 3,721,655.
Gordon, Harry W., to Schmid, Julius, Inc. Method of treating prostatic hypertrophy. 3,721,734, Cl. 424-278.000.
Goss, Edmund S. Piano. 3,721,148, Cl. 84-189.000.
Goto, Kunihiro: *See—*
Shiba, Tadahisa; Tsuruki, Junzo; Takahashi, Masaru; Goto, Kunihiro; and Ono, Isao, 3,721,546.
Goudreau, Noel G., to Conco Inc. Loading balancer. 3,721,416, Cl. 248-325.000.
Gouldthorpe, Hugh W., to United States of America, Army. Detection in a multiple-target environment. 3,721,979, Cl. 343-7.00a.
Goyette, Robert J.: *See—*

Crosby, Philip C.; Goyette, Robert J.; and Bauer, Douglas M., 3,721,001.
Grace, Martin I., to Sperry Rand Corporation. High efficiency mode planar microcircuit high frequency signal generator. 3,721,919, Cl. 331-96.000.
Grace, W. R., & Co.: *See—*
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Graham, Patricia M.: *See—*
Witzel, Bruce E.; Shen, Tsung-Ying; Graham, Patricia M.; Clark, Robert L.; and Pessolano, Arsenio A., 3,721,676.
Grant, Carl C., to Brown & Williamson Tobacco Corporation. Cigarette carton with pack separator. 3,721,335, Cl. 206-48.500.
Graphic Systems, Inc.: *See—*
Tidd, James Alfred, 3,721,174.
Grau, Gerard: *See—*
Fontanel, Andre; and Grau, Gerard, 3,721,954.
Gravimetrics Incorporated: *See—*
Codina, Jorge G., 3,721,984.
Gray, R. Flanagan; Caswell, John; and Muller, William G. Rotogyro. 3,721,403, Cl. 244-7.00a.
Gray, Sidney; Levin, Burton Joshua; and Miller, David Joseph, to RCA Corporation. Comprising a slab of semiconductor material. 3,721,923, Cl. 333-31.00a.
Green, Alfred James, to Westbourne Engineering (Bournemouth) Limited. Rotary water sprinkler. 3,721,388, Cl. 239-230.000.
Green, Charles J., to Rocket Research Corporation. Cool working gas generator. 3,721,102, Cl. 62-48.000.
Greene, Donald W.: *See—*
Caulier, Paul W.; and Greene, Donald W., 3,721,820.
Greenplate, Alvin E., to G-P Industries, Inc. Sawhorse. 3,721,316, Cl. 182-181.000.
Greneker, Gene, III. Telephone range expander. 3,721,771, Cl. 179-41.00a.
Greth, Lewis E.: *See—*
Hesterman, Dennis; and Greth, Lewis E., 3,721,243.
Grieves, Gordon; and Holden, Brian Astbury, to Burgess Micro Switch Company Limited. Arcuate form electrical switches having an axially displaceable actuator. 3,721,791, Cl. 200-168.00g.
Griffith, Russell K.: *See—*
Uebele, Curtis E.; Griffith, Russell K.; and Rosen, Irving, 3,721,724.
Griffith, William J.: *See—*
Falterman, Charles W.; Griffith, William J.; and Fletcher, Perry L., 3,721,031.
Grimes, Arthur Stirling: *See—*
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Grimm, John E.: *See—*
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Groom, James S.: *See—*
Roberts, Franklin B.; and Groom, James S., 3,721,375.
Groschopp, Heinz; Schoenemann, Rudolf; Germscheid, Hans Gunther; and Venschott, Hubert, to Henkel & Cie. GmbH. Process for enamelling steel using an electrolytic nickel preplate. 3,721,614, Cl. 204-38.00c.
Gross, Josef: *See—*
Barkow, William Henry; and Gross, Josef, 3,721,930.
Gross, Richard: *See—*
Von Der Eltz, Hans-Ulrich; Gross, Richard; and Birke, Walter, 3,721,524.
Groth, Daniel F. Aquarium cover. 3,721,212, Cl. 119-5.000.
Gruber, George E., to Monitor Mfg., Inc. Material level indicator for bins or other receptacles. 3,721,971, Cl. 340-246.000.
Gruber, Wolfgang; Bergmeyer, Hans Ulrich; Werner, Wolfgang; Bernt, Erich; and Gawehn, Karlfried, to Boehringer Mannheim GmbH. Reagent composition and process for the determination of glucose. 3,721,607, Cl. 195-103.50c.
GTE Automatic Electric Laboratories Incorporated: *See—*
Krock, Elmer W.; and Simon, Charles J., 3,721,769.
GTE Sylvania Incorporated: *See—*
Bovio, Robert J., 3,721,100.
Buescher, William E., 3,720,985.
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Gallaro, Anthony V., 3,721,849.
Klein, Arthur Harold, 3,721,760.
Mehalchick, Emil J.; Mathers, James E.; and Ferri, John L., 3,721,630.
Guidet, Pierre. Electromagnetic selector. 3,721,876, Cl. 318-265.000.
Gulbins, Klaus: *See—*
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Gulf & Western Industries, Inc.: *See—*
Bressler, Marcus N.; and Sebelish, Norman C., 3,721,363.
Gulf Oil Corporation: *See—*
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Gulf Research & Development Company: *See—*
Fernald, Herbert B.; Hillier, Donald E., Jr.; Hughes, Charles F., Jr.; and Strausser, John R., 3,721,719.
Silver, Richard S.; and Wong, Joel K., 3,721,604.
Stothart, David C., 3,721,806.
Gumbert, Paul, to Bosch, Robert, G.m.b.H. Windshield wiper arrangement. 3,721,878, Cl. 318-443.000.
Gustison, Robert A., to Kawecki Berylco Industries, Inc. Electric furnace method of beneficiating tantalum- and niobium-containing tin slags and the like. 3,721,727, Cl. 423-62.000.
Haas, Frank C., to Oil Shale Corporation, The. Alumina recovery from retorted oil shale residue. 3,721,730, Cl. 423-119.000.
Haas, Kenneth C.: *See—*
Schaffer, Philip O.; Hoverter, Bryce E.; and Haas, Kenneth C., 3,721,204.
Hadtke, Frederick B.; and Galen, Martin P., to Becton, Dickinson and Company. Disposable surgical cover sheet. 3,721,234, Cl. 128-132.00d.
Haferl, Peter Eduard, to RCA Corporation. Waveform generating circuit. 3,721,857, Cl. 315-27.0td.
Haffner, Donald G., to Jacobson Manufacturing Company. Pedal controlled hinged chute for lawn mowers. 3,721,078, Cl. 56-202.000.
Hager, John Grayson, to Fieldcrest Mills, Inc. Terry fabric having high-low pile. 3,721,272, Cl. 139-396.000.
Hague, Joe T.: *See—*
Brandt, George W.; and Hague, Joe T., 3,721,948.
Hahn, George W. Mandibular prosthetic apparatus. 3,720,959, Cl. 3-1.000.
Haley, John S.: *See—*
Cooper, Jerry W.; Williams, Leland E.; Haley, John S.; and Ensley, Rufus N., 3,721,477.
Hall, Richard John; and Shalders, Alan John, to A.C.E. Machinery Limited. Hoists. 3,721,319, Cl. 187-61.000.
Hallden Machine Company, The: *See—*
Ingham, James D., 3,721,131.
Ham, Donald M., to General Electric Company. Zero-reset mechanism for an indicating demand register. 3,721,901, Cl. 324-103.00r.
Hamann, Victoria; and Dawson, Jack C. Theft alarm operable by vibration. 3,721,956, Cl. 340-65.000.
Hambock, Heinz: *See—*
Traber, Walter; Hambock, Heinz; and Weiss, Anton Georg, 3,721,699.
Hamilton Watch Company: *See—*
Dargent, Bruno M., 3,721,084.
Hammar, Erik: *See—*
Norman, Sivert; and Hammar, Erik, 3,721,895.
Hammer, Friedrich W., to Owens-Illinois, Inc. Forehearth addition section. 3,721,540, Cl. 65-27.000.
Hancock, Charles L., to Westinghouse Electric Corporation. Overflow float arrangement for dishwasher. 3,721,783, Cl. 200-84.00r.
Hanni-Werke Korber & Co. KG: *See—*
Kruse, Friedel; Wahle, Gunter; Erdmann, Otto; and Rudszinat, Willy, 3,721,340.
Hannon, James V., to Diversified Packaging, Incorporated. Easy opening packages. 3,721,336, Cl. 206-56.0ab.
Hanscom, Genevieve I.: *See—*
Lazzarini, Louis P., 3,721,145.
Hansen, Douglas R.: *See—*
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Hanser, Paul Edmund, to Deere & Company. Power transmission device for rotating a grader circle. 3,721,303, Cl. 172-792.000.
Hansford, Robert Julian. Construction process and apparatus for forming ceramic walls. 3,721,539, Cl. 65-19.000.
Hanson, Laurence B., to Gardner-Denver. Directional control for rock drill feed support. 3,721,304, Cl. 173-2.000.
Harano, Allen A.: *See—*
Villalobos, Luis F.; Harano, Allen A.; and Breinlinger, Richard H., 3,721,810.
Hardouin, Pierre; and Nicolas, Michel, to La Telemecanique Electrique. Selective interconnection matrix. 3,721,863, Cl. 317-101.0ce.
Harms, William J.: *See—*
Anderson, Theodore D.; and Harms, William J., 3,721,478.
Harrah, Robert E., to Microphor, Inc. Flush toilet and method. 3,720,962, Cl. 4-52.000.
Harris, Michael R., to Phillips Petroleum Company. Blow molding apparatus including ball spline shaft for rapid and precise parison transfer. 3,721,514, Cl. 425-387.000.
Harris, Nicholas D., to Morton-Norwich Products, Inc. Process for preparing diethyl 3,4-dialkoxyanilinomethylenemalonates. 3,721,702, Cl. 260-471.00a.
Harsco Corporation: *See—*
Chaney, Donal W., 3,721,182.
Hartlieb, Otto: *See—*
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Hartmann, Heinrich: *See—*
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Hartmann, Karl: *See—*
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Hassenauer, Robert L., to Amsted Industries Incorporated. Articulated container car. 3,721,199, Cl. 105-366.00a.
Hassler, Heinrich: *See—*
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Hastings, James E. Well screen cleaning device. 3,721,191, Cl. 102-20.000.
Hatanaka, Chitoshi: *See—*
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Hayashibare Company: *See—*
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Hayes, Raymon W.; and Hayes, Raymond J. Hammer with detachable striking tips. 3,721,282, Cl. 145-29.00a.
Hayes, Raymond J.: *See—*
Hayes, Raymon W.; and Hayes, Raymond J., 3,721,282.
Haynes, Milton Ray. Transistorized flashing fish lure. 3,721,033, Cl. 43-17.600.
Hays, Robert G.; and Rhee, Chongkook, to Motorola, Inc. Thin single crystal silicon on an insulating substrate and improved dielectric isolation processing method. 3,721,588, Cl. 148-175.000.
Hays, Robert G.; and Rhee, Chongkook, to Motorola, Inc. Etch stop for koh anisotropic etch. 3,721,593, Cl. 156-17.000.
Haywood, John T., to United States of America, Army. Continuity test and indicating circuit. 3,721,899, Cl. 324-73.00r.
Heidel, Klaus, to Chemische Werke Huls Aktiengesellschaft. Storable photosensitized polyester molding. 3,721,723, Cl. 260-865.000.
Heidelberger Druckmaschinen Aktiengesellschaft: *See—*
Rambausek, Hugo, 3,721,185.
Heim, Joseph. Gas-flow monitoring system. 3,721,123, Cl. 73-194.00e.
Helary, Jean-Louis: *See—*
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Hellerich, Robert, K.G. Eutingen: *See—*
Redinger, Volker, 3,721,275.
Helms, Clifford J., to Sperry Rand Corporation, mesne. Positioning system. 3,721,882, Cl. 318-594.000.
Helms, John D.; and Cecil, Olin B., to Texas Instruments, Incorporated. Low volume deposition reactor. 3,721,210, Cl. 118-48.000.
Henkel & Cie. GmbH: *See—*
Groschopp, Heinz; Schoenemann, Rudolf; Germscheid, Hans Gunther; and Venschott, Hubert, 3,721,614.
Henry, Herbert J.: *See—*
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Herb, Eugen: *See—*
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Herbold, Peter: *See—*
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Hermans, Albert L. Ultrasonic burglar alarm system. 3,721,972, Cl. 340-276.000.
Heron, John B. High voltage monolithic ceramic capacitor. 3,721,871, Cl. 317-261.000.
Hess, William J., to United States of America, Navy. Hardlimiter, automatic symmetry circuit. 3,721,835, Cl. 307-237.000.
Hesterman, Dennis: *See—*
Hesterman, Dennis; and Greth, Lewis E. (said Greth assor. to), 3,721,243.
Hesterman, Dennis; and Greth, Lewis E., said Greth assor. to Hesterman, Dennis. Male urinary incontinence device. 3,721,243, Cl. 128-295.000.
Heth, Sherman C., to Jacobsen Manufacturing Company. Mower for mowing around an object. 3,721,074, Cl. 56-10.400.
Hetzer, Frederick C.: *See—*
Morrison, Abraham; and Hetzer, Frederick C., 3,721,089.
Heugebaert, Frans Clement; and Brinckman, Eric Maria, to Agfa-Gevaert N.V. Photothermographic material containing a photosensitive metal oxide semiconductor or benzophenone and a free metal generating alkanolamine. 3,721,560, Cl. 96-48.0hd.
Hewlett-Packard Company: *See—*
Barrett, John C.; Bergh, Arndt B.; Price, John E.; and Hornak, Tomas, 3,721,964.
Heya, Satoshi: *See—*
Ueno, Saburo; Shimogo, Etsuzo; Kawasaki, Takao; Inmaru, Daisaku; Hirose, Fumio; Heya, Satoshi; Omura, Yoshio; Osaka, Yoshiaki; Fujii, Takayoshi; and Otake, Osamu, 3,721,667.
H.G. Enterprises: *See—*
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Higgins, William E.: *See—*
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Hilbert, Francis H., to Motorola, Inc. Frequency multiplying circuit utilizing time gates and switching signals of differing phases. 3,721,766, Cl. 179-15.0bt.
Hill, Ezra C.: *See—*
Rademaker, Leo C.; and Hill, Ezra C., 3,721,865.
Hill, Harold Taylor; and Caton, Ronald Morris, to Wellworthy Limited. Pistons. 3,721,163, Cl. 92-158.000.
Hillenbrand, Dieter: *See—*
Braumann, Gundokar; Stocker, Helmut; and Hillenbrand, Dieter, 3,721,927.
Hillier, Donald E., Jr.: *See—*
Fernald, Herbert B.; Hillier, Donald E., Jr.; Hughes, Charles F., Jr.; and Strausser, John R., 3,721,719.
Hinkley, David F.; and Hoinowski, Alexander M., to Merck & Co., Inc. Method for preparing ascorbic acid compounds an novel intermediates for preparing same. 3,721,663, Cl. 260-210.00r.
Hino, Hazime; Nakamura, Tsutomu; and Takahashi, Nobuo. Apparatus for the manufacture of crimped bulky filaments. 3,720,983, Cl. 28-1.400.
Hirayama, Takashi: *See—*
Ono, Takeshi; Hirayama, Takashi; and Yamamoto, Kimihiko, 3,721,205.
Hirose, Fumio: *See—*
Ueno, Saburo; Shimogo, Etsuzo; Kawasaki, Takao; Inmaru, Daisaku; Hirose, Fumio; Heya, Satoshi; Omura, Yoshio; Osaka, Yoshiaki; Fujii, Takayoshi; and Otake, Osamu, 3,721,667.
Hirota, Masakazu: *See—*
Minami, Keiichi; Nakaue, Tokuji; Susami, Kozo; Masaaki, Tabata; and Hirota, Masakazu, 3,721,070.
Hirsch, Joseph. Energy absorption apparatus. 3,721,320, Cl. 188-1.00c.
Hirschfeld, Robert A., to Lithic Systems, Inc. Storage energy regulating circuit. 3,721,834, Cl. 307-235.00r.
Hirukawa, Tsuguhisa: *See—*
Ikeda, Yuichi; Yuyama, Choji; Hirukawa, Tsuguhisa; and Isshiki, Yoshio, 3,721,656.
Hiseler, Stanley Robert: *See—*
French, John Lischer; Kessler, Kenneth Quentin; Funk, Welker W.; Pierrot, Victor Charles, III; and Hiseler, Stanley Robert, 3,721,280.
Hitachi, Ltd.: *See—*
Yoshioka, Yoshio, 3,721,786.
Ho, Charles W., 1/2 to Dictron International Corporation and 1/2 to Victor Company of Japan. Telephone answering machine. 3,721,765, Cl. 179-6.00r.
Hoch, Rene Gerard; and Jumelle, Louis Francois, to Societe Nationale d'Etude et de Construction de Moteurs d'Avaition. Silencer or muffler for the composite nozzle of an aircraft jet engine. 3,721,314, Cl. 181-33.0hc.
Hodge, Abram L.; and Fedock, Michael P., to Republic Steel Corporation. Treatment of iron-containing particles. 3,721,548, Cl. 75-25.000.
Hoerner Waldorf Corporation: *See—*
Locke, Frank W., 3,721,381.
Hoffer, Max, to Hoffmann-La Roche Inc. Preparation of 5-cytosine nucleosides. 3,721,664, Cl. 260-211.50r.
Hoffland, Joseph V., to FMC Corporation. Three-way valve. 3,721,265, Cl. 137-625.470.
Hoffman, James T.: *See—*
Shutt, Sidney G.; Hutchings, Thomas J.; and Hoffman, James T., 3,721,497.
Hoffman, Rickie R.; and Hoffman, Roland F. Pitch raising and lowering device for guitars. 3,721,150, Cl. 84-313.000.
Hoffman, Roland F.: *See—*
Hoffman, Rickie R.; and Hoffman, Roland F., 3,721,150.
Hoffman, William F.: *See—*
Battershall, Barry W.; and Hoffman, William F., 3,721,366.
Hoffmann, Dieter: *See—*
Schuierer, Erich; and Hoffmann, Dieter, 3,721,700.
Hoffmann, Dieter; and Stach, Hans, to Fabwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Perfluoro-alkyl-alkylene-sulfonamido-alkylene-dialkylamines and their quaternary ammonium salts. 3,721,706, Cl. 260-501.120.
Hoffmann, Wilhelm: *See—*
Krone, Heinz; and Hoffmann, Wilhelm, 3,721,385.
Hoffmann-La Roche Inc.: *See—*
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Holbrook, Franklin K.; and Rickard, Donn J. Side discharge belt conveyor assembly. 3,721,331, Cl. 198-66.000.
Holden, Brian Astbury: *See—*
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Holland Company: *See—*
Chierici, Osvaldo Frank; and Smith, James Thomas, 3,721,351.
Holland, Thomas M., to United States of America, Army, mesne. Missile roll control mechanism. 3,721,402, Cl. 244-3.220.
Holman, Leonard; and Timms, Richard H., to Rohr Corporation. Jet engine to air inlet duct flexible joint aircraft. 3,721,460, Cl. 285-175.000.
Holophane Company, Inc.: *See—*
Zeller, Robert D., 3,721,816.
Holotron Corporation: *See—*
St. John, Daniel S., 3,721,312.
Homan, Alfred A.; and Brockman, Herbert P., to United States of America, Navy, mesne. Single line bi-directional data transmission system. 3,721,763, Cl. 178-58.00r.
Homza, John: *See—*
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Hori, Hiroshi; Kosuge, Shoji; Matsunaga, Toshio; and Someya, Eishichi, to Japan Steel Works Ltd. Automatic reel mounting device for a continuous winding machine. 3,721,397, Cl. 242-67.10r.
Hornagold, John T., to Bucyrus-Erie Company. Light weight telescoping boom. 3,721,054, Cl. 52-115.000.
Hornak, Tomas: *See—*
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Hortig, Hans-Peter; and Schutz, Karl-Friedrich, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Process and device for sterilizing by flaming containers for pharmaceutical preparations. 3,721,525, Cl. 21-2.000.
Horvath, Steve. Reflector. 3,721,489, Cl. 350-97.000.
Hosmer, Thomas P.: *See—*
Sheppard, John C.; and Hosmer, Thomas P., 3,721,101.
Hough, William T. Forward-osmosis solvent extraction. 3,721,621, Cl. 210-22.000.
Houilleres du Bassin du Nord & Du Pas-De-Calais: *See—*
Boel, Charles; Pot, Francois; and Sachot, Claude, 3,721,052.
House, Ralph: *See—*
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Hovsepian, Boghos Karnig, to Du Pont de Nemours, E. I., and Company. Rolling of lithium. 3,721,113, Cl. 72-46.000.
Howe-Baker Engineers, Inc.: *See—*
Childree, Herman I.; and Trawick, Stewart I., 3,721,226.
Howell, Elvin L.; and Corwith, James, to International Harvester Company. Unloader tube latching mechanism. 3,721,359, Cl. 214-522.000.
Howell Instrument, Inc.: *See—*
Howell, John S.; and Rowan, Richard L., 3,721,120.
Howell, John S.; and Rowan, Richard L., to Howell Instrument, Inc. Engine performance indicator. 3,721,120, Cl. 73-117.300.
Howles, Clement Roger, to Aluminum Company of America. Method of continuously casting plate with texture surface. 3,721,287, Cl. 164-73.000.
Hubbard, William C.; Geren, Keith E.; and Sauer, Warren A., to United States of America, Navy. Echo repeater target. 3,721,949, Cl. 340-3.00e.
Hubbell, Harvey, Incorporated: *See—*
Paoli, Alfred, 3,721,869.
Hubert, Franz Hans, to Becton, Dickinson and Company. Catheter for high pressure injections. 3,721,231, Cl. 128-2.50r.
Hucko, Henry; and Lusignan, Henry T., to General Electric Company. High voltage bushing with removable connector and locking plate. 3,721,946, Cl. 339-75.00r.
Hughes Aircraft Company: *See—*
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Hughes, Charles F., Jr.: *See—*
Fernald, Herbert B.; Hillier, Donald E., Jr.; Hughes, Charles F., Jr.; and Strausser, John R., 3,721,719.
Hughes, David Emrys; and Davies, Donald, to Coal Industry (Patents) Limited. Apparatus for handling flexible supply lines. 3,721,378, Cl. 226-119.000.
Hughes, John H.; and Duryea, Daniel F., to Olin Corporation. Injection-expansion molded shotshell wad and method of forming the same. 3,721,197, Cl. 102-95.000.
Hughes, Robert, Associates, Ltd.: *See—*
Toan, Danforth W., 3,721,056.
Hughes, William B.; and Zuech, Ernest A., to Phillips Petroleum Company. Conversion of olefins using complexes of fe, ru, os, rh or ir with organoaluminums. 3,721,718, Cl. 260-683.00d.
Hugo, Etienne: *See—*
Machon, Raymond; Flechet, Jean; and Hugo, Etienne, 3,721,522.
Hults, Harold W., to Cutler-Hammer, Inc. Integrated wire termination system with integral retainer. 3,721,945, Cl. 339-74.00r.
Humphreys & Glasgow Limited: *See—*
Jones, Gordon Kenneth, 3,721,611.
Hurlbert, Clifford F., to Boeing Company, The. Aircraft wing airflow control system. 3,721,406, Cl. 244-42.00d.
Huron Products Company: *See—*
Pierce, Don C., Jr., 3,721,384.
Hurx, Ardianus Antonius: *See—*
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Hutchings, Thomas J.: *See—*
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Hutton, Jonathan; and Stacey, Gilbert Joseph, to Imperial Chemical Industries Limited. Phenylfuran- and phenylthiophene-alkanols and derivatives thereof. 3,721,681, Cl. 260-332.30r.
Hyatt, John W. Automatic pipe handling system. 3,720,992, Cl. 29-430.000.
Ikebe, Jun: *See—*
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Ikebe, Yo; Ikebe, Jun; and Inaba, Seiuemon, to Fujitsu Limited. Rotary pilot valve. 3,721,266, Cl. 137-625.690.
Ikeda, Yuichi; Yuyama, Choji; Hirukawa, Tsuguhisa; and Isshiki, Yoshio, to Ameliotex, Inc. Method of producing stable polyurethane solutions. 3,721,656, Cl. 260-77.5aa.
Illinois Tool Works Inc.: *See—*
Braun, Leonard C.; and Klygis, M. Julius, 3,721,337.
Imai, Hirosuke; and Matsuno, Mitsuo, to Nippon Oil Company Limited. Process for the preparation of 5-alkylide nenorbornene-2. 3,721,716, Cl. 260-666.00p.
Imperial Chemical Industries Limited: *See—*
Hutton, Jonathan; and Stacey, Gilbert Joseph, 3,721,681.
Imperial-Eastman Corporation: *See—*
Chudgar, Anil H., 3,721,271.
Impulsphysik GmbH: *See—*
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Inaba, Shigeho: *See—*
Yamamoto, Hisao; Inaba, Shigeho; Arasaki, Seitetsu; Aruyama, Isamu; Takahashi, Kei; Saito, Chiharu; and Sakai, Shigeru, 3,721,671.
Inaga, Katsu, to Sony Corporation. Magnetic recording and/or reproducing apparatus. 3,721,776, Cl. 179-100.20t.
Indak Manufacturing Corporation: *See—*
Raab, Andrew F., 3,721,779.
Indiana University Foundation: *See—*
Katz, Simon, 3,721,691.
Industrial Dyestuff Company: *See—*
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Ingersoll, Henry Grant: *See—*
Macioge, Frank Anthony; and Ingersoll, Henry Grant, 3,721,484.
Ingham, James D., to Hallden Machine Company, The. Meshing gears with each pitchline formed of different non-circular curves and a method of obtaining their pitchline profile geometries. 3,721,131, Cl. 74-393.000.
Inmaru, Daisaku: *See—*
Ueno, Saburo; Shimogo, Etsuzo; Kawasaki, Takao; Inmaru, Daisaku; Hirose, Fumio; Heya, Satoshi; Omura, Yoshio; Osaka, Yoshiaki; Fujii, Takayoshi; and Otake, Osamu, 3,721,667.
Innerbickler, Peter. Cement cobbler. 3,721,024, Cl. 36-4.000.
Inoue, Nobuyuki, to Process Shizai Company Limited. Method for transferring colored image and light-sensitive transfer sheets therefor. 3,721,557, Cl. 96-28.000.
Institut elektrosvarki imeni E.O. Patona Akademii Nauk: *See—*
Skachko, Jury Nikolaevich; Moshkin, Venedikt Feofanovich; Garkaljuk, Rodimir Ivanovich; Popov, Nikolai Vladimirovich; Polukhin, Valery Vasilievich; Korshunov, Igor Illarionovich; Bokov, Vladimir Mikhailovich; and Skorudsky, Boris Pavlovich, 3,721,793.
Institut Francais du Petrole des Carburants et Lubrifiants: *See—*
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Instronics Ltd: *See—*
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International Business Machines Corporation: *See—*
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Berkman, John W.; Lagergren, Richard E.; Ricklefs, Merlin J.; and Schaffer, Walter S., 3,721,781.
Blakeslee, A. Eugene, 3,721,583.
Brickman, Norman F.; and Freeman, Leo B., Jr., 3,721,838.
Dimmick, Roger F.; Lagergren, Richard E.; Markley, Robert F.; Ricklefs, Merlin J.; and Schaffer, Walter S., 3,721,808.
Edstrom, Gene H.; Elwell, Russell M.; and Irwin, John W., 3,721,961.
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International Computers Limited: *See—*
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Stevenson, Timothy John; and Yardy, Raymond, 3,721,842.
International Harvester Company: *See—*
Howell, Elvin L.; and Corwith, James, 3,721,359.
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International Paper Company: *See—*
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Lee, Charles A.; and Sorrells, Frank D., 3,721,016.
International Standard Electric Corporation: *See—*
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Geesen, Michel Pierre Georges; and Laganier, Andre Pierre, 3,721,906.
Staiger, Bruno, 3,721,278.
International Telephone and Telegraph Corporation: *See—*
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Garnett, Lawrence Taylor, 3,721,505.
Paugh, Edward C., 3,721,939.
Interstate Electronics Corporation: *See—*
Schmidt, Ralph Otto, 3,721,812.
Irie, Namio. Electronic control device for automatic power transmission mechanism. 3,721,136, Cl. 74-856.000.
Irving, Joseph F. Vehicle mounted loader and unloader. 3,721,355, Cl. 214-80.000.
Irwin, George W., to Owens-Illinois, Inc. Multiple-cavity glass mold opening apparatus. 3,721,545, Cl. 65-261.000.
Irwin, John W.: *See—*

Edstrom, Gene H.; Elwell, Russell M.; and Irwin, John W., 3,721,961.

Ishida, Kinyu, to Teijin Limited. Apparatus for handling undrawn spun yarn in synthetic yarn producing mill. 3,721,081, Cl. 57-34.00r.

Ishizuka, Terukazu: *See—*
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Isshiki, Yoshio: *See—*
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Itek Corporation: *See—*
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Itoh, Hideo: *See—*
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Iwaasa, Takashi: *See—*
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Jablon, Harry: *See—*
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Jackson, Harold Ernest, to Petrol Injection Limited. Fuel injector nozzles. 3,721,390, Cl. 239-585.000.

Jackson, Janko. Azimuthal propulsion-control system. 3,721,405, Cl. 244-17.210.

Jacobs, Paul H.: *See—*
Fierstien, Gary N.; and Jacobs, Paul H., 3,721,932.

Jacobsen, John C.; and Wilson, John S., to Allied Gear and Machine Co., Inc. Printing cylinder assembly. 3,721,188, Cl. 101-375.000.

Jacobsen Manufacturing Company: *See—*
Heth, Sherman C., 3,721,074.

Jacobson Manufacturing Company: *See—*
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Jaeken, Jan: *See—*
Van Listhout, Jan August; and Jaeken, Jan, 3,721,823.

Jaffe, Leo. Apparatus for composing documents. 3,721,173, Cl. 95-85.000.

Jaffee, Robert D.; and Olson, Ralph B., to Amco Wire Products Corporation. Portable tray cart. 3,721,349, Cl. 211-126.000.

Jakubaschk, Horst: *See—*
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Japan Steel Works Ltd.: *See—*
Hori, Hiroshi; Kosuge, Shoji; Matsunaga, Toshio; and Someya, Eishichi, 3,721,397.

Jarema, Alexander J., to Solar Basic Industries, Inc. Rocking hearth furnace. 3,721,334, Cl. 198-218.000.

Jarowenko, Wadym, to National Starch and Chemical Corporation. Continuous process for the preparation of modified starch dispersions. 3,721,575, Cl. 106-213.000.

Jasinski, Raymond J.; and Gaines, Lewis H., to Tyco Laboratories, Inc. Method of removing water from lithium batteries. 3,721,586, Cl. 136-175.000.

Jauch, Erhard, Uhrenfabrik: *See—*
Jauch, Heinz, 3,721,083.

Jauch, Heinz, to Jauch, Erhard, Uhrenfabrik. Calendar clock. 3,721,083, Cl. 58-3.000.

Jefferson Chemical Company, Inc.: *See—*
Moss, Philip Hotchkiss; and Cuscurida, Michael, 3,721,665.

Jeffras, Nathaniel B., to Automation Industries, Inc. Curvature control. 3,721,118, Cl. 73-67.800.

Jenifer, Richard M.; Payne, Robert A.; and Sobchak, Frank L., to Stewart-Warner Corporation. Message display system and pictorial programmer therefor. 3,721,974, Cl. 340-339.000.

Jenne, Fredrick B., to North American Rockwell Corporation. Photon to digital converter using photon flux integration. 3,721,963, Cl. 340-173.01m.

Jerchower, Lewis A., to Pioneer Industries; division of SOS Consolidated Inc. Drywall door frame. 3,721,055, Cl. 52-217.000.

Jetronic Industries, Inc.: *See—*
Jurjans, Ojars, 3,721,908.

Jinbo, Shoji; Kedo, Setsuo; and Yaegashi, Takehisa, to Toyota Jidosha Kogyo Kabushiki Kaisha. Clutch device. 3,721,794, Cl. 192-70.190.

JOBIN-YvON,: *See—*
Pieuchard, Guy; Flamand, Jean; and Labeyrie, Antoine, 3,721,487.

Johnson, Bernard H., to Gatco Rotary Bushing Company. Rotary tool holder. 3,721,503, Cl. 408-238.000.

Johnson, Bruce K., to Polaroid Corporation. Range responsive flash unit. 3,721,169, Cl. 95-11.001.

Johnson, Bruce K., to Polaroid Corporation. Apparatus for adapting a reflex camera to use with a monocular microscope. 3,721,170, Cl. 95-12.000.

Johnson Farm Machinery Co., Inc.: *See—*
Johnson, Roy W., 3,721,132.

Johnson Plastic Corporation: *See—*
Gooding, Gale A., 3,721,762.

Johnson, Roy W., to Johnson Farm Machinery Co., Inc. Intermittent drive for conveyors and the like. 3,721,132, Cl. 74-394.000.

Jolly, Jean; and Pierdet, Andre, to Roussel-UCLAF. Novel 19-nor 4,9-pregnodienes. 3,721,685, Cl. 260-397.400.

Jones, Gerald Cedric; and Leek, Herbert Bentley, to Saunders Valve Company Limited. Seat assembly for ball valves. 3,721,425, Cl. 251-174.000.

Jones, Gordon Kenneth, to Humphreys & Glasgow Limited. Process for the production of metals. 3,721,611, Cl. 204-1.00r.

Jones, Maurice R.: *See—*
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Jones, Rexford W.; and Thompson, William B., to Staley, A. E., Manufacturing. Dye imbibition imaging. 3,721,561, Cl. 96-48.000.

Jorgensen, Stig W.; and Kearsley, Wayne A. Responsive navigation beacon. 3,721,950, Cl. 340-3.00e.

Joyal, Arthur B.: *See—*
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Jumelle, Louis Francois: *See—*
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Jurien de la Graviere, Marcel: *See—*
Gallay, Jean-Jacques; Helary, Jean-Louis; and Jurien de la Graviere, Marcel, 3,721,549.

Jurjans, Ojars, to Jetronic Industries, Inc. Programable timer for controlling the injection of additives to a dry cleaning solvent charge. 3,721,908, Cl. 328-131.000.

K-S-H, Inc.: *See—*
Stahlhut, Leo G., 3,721,818.

Kabel- und Metallwerke Gutehoffnungshutte Aktiengesellschaft: *See—*
Reiser, Hans Joachim, 3,721,394.
Wagele, Rolf K., 3,720,994.

Kabushiki Kaisha: *See—*
Fujimoto, Sakae; Kato, Saburo; Koizumi, Masami; and Sue, Takaji (said Koizumi and said Sue assors. to), 3,721,775.

Kakizaki, Takehiro; and Kubota, Yasuharu, to Sony Corporation. Image pickup tube. 3,721,752, Cl. 178-5.4st.

Kakuta, Shoichiro: *See—*
Yanagi, Akio; Kakuta, Shoichiro; and Yata, Kintaro, 3,721,166.

Kalaf, George P.: *See—*
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Kaman Aerospace Corporation: *See—*
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Kamimura, Masato; and Fukui, Saburo, to Nippon Electric Company, Limited. Device for cutting an outer layer of the concentric multilayer rod-like structure. 3,721,138, Cl. 81-9.510.

Kanatsiz, Necati: *See—*
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Kano, Motomi: *See—*
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Kaspaul, Alfred F., to Hughes Aircraft Company. Image exposure and development method. 3,721,496, Cl. 355-77.000.

Kastinger, Max. Sports boot. 3,721,023, Cl. 36-2.5al.

Kato, Saburo: *See—*
Fujimoto, Sakae; Kato, Saburo; Koizumi, Masami; and Sue, Takaji, 3,721,775.

Katz, Simon, to Indiana University Foundation. Difluoroxalatostannate (II) complexes. 3,721,691, Cl. 260-429.700.

Kaufer, Carl. Cable winch. 3,721,426, Cl. 254-167.000.

Kaufman, Craig R.: *See—*
Kaufman, Craig R.; and Strick, Daniel R., 3,721,991.

Kaufman, Craig R.; and Strick, Daniel R., 80% to Kaufman, Craig R., 4% to Kaufman, Lois J., 4% to Kaufman, Irving R., 10% to Wedner, Benjamin M. and 2% to Strick, Daniel R. Laser line printer. 3,721,991, Cl. 346-108.000.

Kaufman, Irving R.: *See—*
Kaufman, Craig R.; and Strick, Daniel R., 3,721,991.

Kaufman, Lois J.: *See—*
Kaufman, Craig R.; and Strick, Daniel R., 3,721,991.

Kaufmann, Lothar: *See—*
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Kawakami, Hirotake: *See—*
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Kawakyu, Koichi: *See—*
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Kawano, Shigeru: *See—*
Oishi, Hiroshi; Aoki, Fumio; Kawano, Shigeru; Kikuta, Setsuo; and Shirakawa, Masami, 3,721,830.

Kawasaki, Takao: *See—*
Ueno, Saburo; Shimogo, Etsuzo; Kawasaki, Takao; Inmaru, Daisaku; Hirose, Fumio; Heya, Satoshi; Omura, Yoshio; Osaka, Yoshiaki; Fujii, Takayoshi; and Otake, Osamu, 3,721,667.

Kawase, Toshiharu; and Awakura, Yukio, to Aisin Seiki Company Limited. Method and apparatus for the control of antiskid brake system for powered vehicles. 3,721,475, Cl. 303-21.00f.

Kawazoko, Yoshiako: *See—*
Yazawa, Yasaburo; and Kawazoko, Yoshiako, 3,721,114.

Kawecki Berylco Industries, Inc.: *See—*
Gustison, Robert A., 3,721,727.

Kearney, Kevin David Nicholas: *See—*
Wyness, Keith Gordon; Dodd, Alan Roy; Dixon, John Nigel; and Kearney, Kevin David Nicholas, 3,720,971.

Kearns, Robert W. Structure for and method of surface condition sensing and indicating and motor speed control. 3,721,115, Cl. 73-9.000.

Kearsley, Wayne A.: *See—*
Jorgensen, Stig W.; and Kearsley, Wayne A., 3,721,950.

Kedo, Setsuo: *See—*
Jinbo, Shoji; Kedo, Setsuo; and Yaegashi, Takehisa, 3,721,794.

Kekc, Gary L.: *See—*
Ball, Stephen D.; and Kekc, Gary L., 3,721,235.

Keller, Robert H., to Owens-Illinois, Inc. Funnel air mounted mold lubrication apparatus. 3,721,542, Cl. 65-169.000.

Kelley, Oliver K., to General Motors Corporation. Compound planetary gearing. 3,721,135, Cl. 74-761.000.
Kelly, Robert R.; and Ward, Donald H., to Borg-Warner Corporation. Limit switch assembly including rotatable cam with longitudinally guided indexing nut and cam longitudinal displacement means. 3,721,780, Cl. 200-47.000.
Kendall Company, The: *See—*
Patience, Donald, 3,720,957.
Kent, Jan Herbert, to Kentredder Limited. Buffing machine. 3,721,284, Cl. 157-13.000.
Kentredder Limited: *See—*
Kent, Jan Herbert, 3,721,284.
Kern, Frederick W., to Eastman Kodak Company. Print stripping device. 3,721,171, Cl. 95-13.000.
Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung: *See—*
Riedel, Hans-Jurgen, 3,721,533.
Kerr, Donald D. Molded plastic cover to enclose a snowmobile on a trailer. 3,721,467, Cl. 296-28.00m.
Kessler, Arthur, to Leitz, Ernst, G.m.b.H. Electromagnetic shutter release for continuous operation and single-frame operation in motion picture cameras. 3,721,492, Cl. 352-137.000.
Kessler, Hans-Joachim: *See—*
Rufer, Clemens; Albrecht, Rudolf; Kessler, Hans-Joachim; and Schroder, Eberhard, 3,721,668.
Kessler, Kenneth Quentin: *See—*
French, John Lischer; Kessler, Kenneth Quentin; Funk, Welker W.; Pierrot, Victor Charles, III; and Hiseler, Stanley Robert, 3,721,280.
Keve, Edward Thomas: *See—*
Lock, Peter John; and Keve, Edward Thomas, 3,721,628.
Kidd, Alan Lister, to Smith, Dorman, Switchgear Limited. Locator spring structure for contact assembly of high voltage electrical circuit breakers. 3,721,788, Cl. 200-166.00r.
Kikkoman Shayu Co., Ltd.: *See—*
Yokotsuka, Tamotsu; Iwaasa, Takashi; and Fujii, Mitsuharu, 3,721,606.
Kikuta, Setsuo: *See—*
Oishi, Hiroshi; Aoki, Fumio; Kawano, Shigeru; Kikuta, Setsuo; and Shirakawa, Masami, 3,721,830.
Kilbourn, Dean R.: *See—*
Shum, John, Jr.; Kilbourn, Dean R.; and Lin, Chao H., 3,721,032.
Kindore, Harry L. Locking wire cinch strap. 3,721,412, Cl. 248-73.000.
Kinross, Rupert Ivor: *See—*
Gabriel, Ralph Parton; and Kinross, Rupert Ivor, 3,721,929.
Kitrilakis, Sotiris S., to Thermo Electron Corporation. Gas heating and cooling system. 3,721,509, Cl. 417-339.000.
Kittle, Carl Edwin, to Deere & Company. Hydro-mechanical detent mechanism. 3,721,160, Cl. 91-426.000.
Klein, Arthur Harold, to GTE Sylvania Incorporated. Blanking circuitry for blanking a cathode ray tube. 3,721,760, Cl. 178-7.50r.
Klingel, Hans: *See—*
Leibinger, Berthold; Herb, Eugen; and Klingel, Hans, 3,721,154.
Klink, Arthur E.; and Paul, Edward L., to Merck & Co., Inc. Photochemical reactor. 3,721,822, Cl. 250-43.500.
Klohr, Robert; Tascher, Edward R.; Beld, John W.; and Koenig, Elmer A., to Sherwood Medical Industries, Inc. Rigid container assembly for syringe. 3,721,241, Cl. 128-221.000.
Kluge, Gerald A., to Ampex Corporation. Magnetic head transducer assembly for redundantly recording data on and reproducing data from dual-tracks of a magnetic recording medium. 3,721,773, Cl. 179-100.20t.
Klygis, M. Julius: *See—*
Braun, Leonard C.; and Klygis, M. Julius, 3,721,337.
Knappenberger, Thomas A., to Motorola, Inc. Shielding techniques for R. F. circuitry. 3,721,746, Cl. 174-35.0ms.
Kniazuk, Michael: *See—*
Prediger, Fred Robert; and Kniazuk, Michael, 3,721,228.
Knight, Geoffrey Thomas: *See—*
Cain, Maurice Edward; Knight, Geoffrey Thomas; Gazeley, Keith Frederick; and Lewis, Peter McHigh, 3,721,659.
Knight, George R., Jr.: *See—*
Bridges, Thomas F.; Knight, George R., Jr.; and Mertl, Ivan, 3,721,362.
Knippenberg, Wilhelmus Franciscus; and Gerrit, Verspui, to U.S. Philips Corporation, mesne. Method of manufacturing filamentary bodies of circular cross-section consisting of silicon carbide single crystals and filamentary bodies obtained by said method. 3721,732, Cl. 423-346.000.
Knippenberg, Wilhelmus Franciscus; and Verspui, Gerrit, to U.S. Philips Corporation. Camera tube having photoconductive lead monoxide layer on silicon carbide signal plate. 3,721,848, Cl. 313-65.00a.
Knoll, Alois. Phototype composing machine with rotary character drum. 3,721,165, Cl. 95-4.50r.
Kobayashi, Akio: *See—*
Maemoto, Kenichi; Sano, Takezo; and Kobayashi, Akio, 3,721,721.
Kobayashi, Toshiaki: *See—*
Murai, Koichi; Akazome, Giichi; Choshi, Yasuo; Kobayashi, Toshiaki; and Tsuji, Atsuo, 3,721,682.
Kobe Steel, Ltd.: *See—*
Arikawa, Masayasu; Kano, Motomi; and Okuda, Naoki, 3,721,797.
Kocher, Erich J., to Vilter Manufacturing Corporation. Refrigerant cooled compressor. 3,721,108, Cl. 62-470.000.
Koeber, Henry J., to Bell & Howell Company. Film take-up with ratchet. 3,721,401, Cl. 242-207.000.
Koenig, Elmer A.: *See—*
Klohr, Robert; Tascher, Edward R.; Beld, John W.; and Koenig, Elmer A., 3,721,241.
Koizumi, Masami: *See—*
Fujimoto, Sakae; Kato, Saburo; Koizumi, Masami; and Sue, Takaji, 3,721,775.
Kolb, Karl Heinz: *See—*
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Kollsman Instrument Corporation: *See—*
Narodny, Leo; and Sharpe, Louis E., 3,721,498.
Koneta Rubber Company, Inc.: *See—*
Lea, Harlan L., 3,721,459.
Koo, Tuh-Kai: *See—*
Foster, John E.; and Koo, Tuh-Kai, 3,721,962.
Kooistra, Willem: *See—*
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Kopel, Leroy A.: *See—*
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Koppers Company, Inc.: *See—*
Baum, Melvin E., 3,721,722.
Korshunov, Igor Illarionovich: *See—*
Skachko, Jury Nikolaevich; Moshkin, Venedikt Feofanovich; Garkaljuk, Rodimir Ivanovich; Popov, Nikolai Vladimirovich; Polukhin, Valery Vasilievich; Korshunov, Igor Illarionovich; Bokov, Vladimir Mikhailovich; and Skorudsky, Boris Pavlovich, 3,721,793.
Kosuge, Shoji: *See—*
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Kowalik, John J.: *See—*
Scarnato, Thomas J.; Peacock, Peter J.; Cicci, George B.; Krage, Paul W.; and Kowalik, John J., 3,721,073.
Kozacka, Frederick J., to Chase-Shawmut Company, The. High current-carrying-capacity dual element fuse. 3,721,935, Cl. 337-164.000.
Krage, Paul W.: *See—*
Scarnato, Thomas J.; Peacock, Peter J.; Cicci, George B.; Krage, Paul W.; and Kowalik, John J., 3,721,073.
Kraissl, Frederick, Jr. Method and apparatus for holding gems. 3,721,465, Cl. 294-64.00r.
Kramer, George C., to Branson Instruments, Incorporated. Electronic incidence and coincidence safety control circuit. 3,721,833, Cl. 307-232.000.
Kramer, Stanley I., to Fairchild Industries, Inc. Range measuring system. 3,721,986, Cl. 343-112.00r.
Krapcho, John, to Squibb, E. R., & Sons. Substituted anilides. 3,721,710, Cl. 260-562.00r.
Kraus, Gerard, to Phillips Petroleum Company. Apparatus for carbon black production. 3,721,529, Cl. 23-259.500.
Kraus, Michael Henry, Jr., to Amsted Industries Incorporated. Clamping device. 3,721,323, Cl. 188-206.00r.
Krawagna, Alois A., to Westhem Corporation Limited. Biased hinges. 3,720,979, Cl. 16-150.000.
Krock, Elmer W.; and Simon, Charles J., to GTE Automatic Electric Laboratories Incorporated. Call metering for pabx telephone system. 3,721,769, Cl. 179-18.0ad.
Krone G.m.b.H.: *See—*
Krone, Heinz; and Hoffmann, Wilhelm, 3,721,385.
Krone, Heinz; and Hoffmann, Wilhelm, to Krone G.m.b.H. Savings bank with an insertion slot safety mechanism and a key operated lock. 3,721,385, Cl. 232-4.00r.
Kruse, Friedel; Wahle, Gunter; Erdmann, Otto; and Rudszinat, Willy, to Hanni-Werke Korber & Co. KG. Method and apparatus for transporting cigarette packs or the like. 3,721,340, Cl. 209-74.00r.
Krusko, Evelyn H., to Scott Paper Company. Disposable diapers. 3,721,242, Cl. 128-287.000.
Kubick, Richard J., to De Wiant Corporation, mesne. Method of forming protective coatings on ferrous metal and the resulting article. 3,721,534, Cl. 29-195.000.
Kubota, Yasuharu: *See—*
Kakizaki, Takehiro; and Kubota, Yasuharu, 3,721,752.
Kugler, Carl J.; and Porter, Norman, to Singer Company, The. Thermal actuator for a meter temperature compensating mechanism. 3,721,125, Cl. 73-368.300.
Kuhn, Franz Josef: *See—*
Weber, Karl-Heinz; Zeile, Karl; Dannebert, Peter; Giesemann, Rolf; Bauer, Adolf; Merz, Herbert; and Kuhn, Franz Josef, 3,721,666.
Kuhne, Christoph, to Zeiss, Carl-Stiftung; d/b/a Zeiss, Carl. Focusing arrangement for a focal telescopes. 3,721,488, Cl. 350-46.000.
Kuijsten, Han, to Omron Systems, Inc. Keyboard coding and interlock system. 3,721,976, Cl. 340-365.00s.
Kulhavy, Joseph T., to Case, J. I., Company. Fluid-actuated cylinder assemblage. 3,721,162, Cl. 92-128.000.
Kumiai Chemical Industry Co., Ltd.: *See—*
Sugiyama, Hironari; Yoshinaga, Eiichi; and Itoh, Hideo, 3,721,736.
Kureha Kagaku Kogyo Kabushiki Kaisha: *See—*

Ueno, Saburo; Shimogo, Etsuzo; Kawasaki, Takao; Inmaru, Daisaku; Hirose, Fumio; Heya, Satoshi; Omura, Yoshio; Osaka, Yoshiaki; Fujii, Takayoshi; and Otake, Osamu, 3,721,667.

Kusmer, Kasimir C., 1/2 to Romack, Paul L. Swimming exercisers. 3,721,438, Cl. 272-71.000.

Kvasnes, Harald, 1/2 to A/S Spilka. Hinge means for reversible windows. 3,721,044, Cl. 49-248.000.

La Telemecanique Electrique: *See—*
Hardouin, Pierre; and Nicolas, Michel, 3,721,863.
Roumagnac, Michel, 3,721,782.

Labeyrie, Antoine: *See—*
Pieuchard, Guy; Flamand, Jean; and Labeyrie, Antoine, 3,721,487.

Labofina S.A.: *See—*
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Laboratories Jacques Logeais: *See—*
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Laganier, Andre Pierre: *See—*
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Lagergren, Richard E.: *See—*
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Dimmick, Roger F.; Lagergren, Richard E.; Markley, Robert F.; Ricklefs, Merlin J.; and Schaffer, Walter S., 3,721,808.

Lakes, John D. Gas safety device. 3,721,536, Cl. 48-193.000.

Lamarche, Robert Ernest; May, Carl Jerome, Jr.; Rosenthal, Charles William; and Saal, Frederick Alan, to Bell Telephone Ricoh Laboratories, Incorporated. Delay compensation in multiplex transmission systems. 3,721,767, Cl. 179-15.0as.

Lambie, Alan James: *See—*
Burton, Dennis Ernest; Newbold, Geoffrey Tattersall; Percival, Albert; Lambie, Alan James; and Sencial, Ian Robert, 3,721,678.

Lamke, Arland D., to McGraw-Edison Company. Motion transfer connecting device. 3,721,134, Cl. 74-586.000.

Lampert, Laurence L.; and Joyal, Arthur B., to Minijet Sportscrafts Inc. Vehicle and apparatus for moving the vehicle through a fluid. 3,721,208, Cl. 115-6.100.

Lamperti, Enrico. Eyelet making device for springs, to be coupled to winding machines and operating at the same output speed of the latter. 3,721,276, Cl. 140-103.000.

Lamy, Michel; and Billard, Jacques, to Thomson-CSF. Waveguide directional coupler. 3,721,921, Cl. 333-10.000.

Lana, Lori, Wigs Limited: *See—*
Mason, Leonite Kathleen, 3,721,251.

Land, Edwin H., to Polaroid Corporation. Integral laminate photographic units comprising developing composition-spreader sheets containing a polymeric acidifying layer. 3,721,562, Cl. 96-61.00m.

Landis, David M., to Thomas & Betts Corporation. Applicator electrodes with a very thin non-metallic, current distributing layer. 3,721,246, Cl. 128-404.000.

Landrum, Porter: *See—*
Landrum, Porter, 3,721,430.

Landrum, Porter, 45% to Landrum, Porter, McMorris, Edward Y., mesne, 25% to Landrum, Porter, Jr., 10% to Null, William (Mrs.), 10% to Timberlake, Marshall, (Mrs.) and 10% to McMorris, Willie Mae, (Mrs.). Fuel preparation system for carburetor. 3,721,430, C. 261-142.000.

Landrum, Porter, Jr.: *See—*
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Lang, Walter, to Zeiss, Carl-Stiftung; d/b/a Zeiss, Carl. Method of and device for the automatic focusing of microscopes. 3,721,759, Cl. 178-7.200.

Lannou, Louis: *See—*
Brachet, Alain; and Lannou, Louis, 3,721,116.

Lanzo, Rosario; and Rainaldi, Nicolino, to Montecatini Edison. Process for the preparation of self-extinguishing polymers. 3,721,646, Cl. 260-45.70r.

Laprade, Bernard: *See—*
Gele, Pierre; Laprade, Bernard; and Laprade, Xavier, 3,721,428.

Laprade, Xavier: *See—*
Gele, Pierre; Laprade, Bernard; and Laprade, Xavier, 3,721,428.

Laridon, Urbain Leopold; Delzenne, Gerard Albert; and Peeters, Hugo Karel, to Gevaert-Agfa N.V. Increasing the light sensitivity of polymeric compositions comprising azido groups. 3,721,566, Cl. 96-115.00r.

Larralde, Edward: *See—*
Ahlstone, Arthur G.; and Larralde, Edward, 3,721,293.

Larsen, Earl I., to Malloy, P. R., & Co., Inc. Liquid phase sintered molybdenum base alloys. 3,720,990, Cl. 29-182.000.

Larson, Eugene A.; Kopel, Leroy A.; and McNulty, Daniel E. Transducer for pulse-echo ultrasonic exploration. 3,721,227, Cl. 128-2.00v.

Latash, Jury Vadimovich: *See—*
Paton, Boris Evgenievich; Medovar, Izrailevich Boris; Latash, Jury Vadimovich; Chekotilo, Leonty Vasilievich; Baglai, Vitaly Mikhailovich; Artamonov, Viktor Leonidovich; Garkaljuk, Rodimir Ivanovich; Timchenko, Viktor Anatolievich; Malichekno, Evgeny Fedorvich; Stupak, Leonid Mikhailovich; and Dubinsky, Rudolf Solomonovich, 3,721,286.

Laurent, Henry; Kolb, Karl Heinz; and Wiechert, Rudolf, to Schering Aktiengesellschift. Novel 6a-fluoro-11-b-hydroxy-16a-methyl-21-haloprogesterones. 3,721,686, Cl. 260-397.450.

Laurie, C. Keith: *See—*
Miller, Robert Boothe; and Laurie, C. Keith, 3,721,567.

Lavik, Melvin T.: *See—*
McConnell, Bobby D.; Lavik, Melvin T.; and Campbell, Mahlon E., 3,721,625.

Lawrence, Jack G.: *See—*
Burks, Warren C.; and Lawrence, Jack G., 3,721,902.

Layman, Bobby C.: *See—*
Drew, Gene R.; and Layman, Bobby C., 3,721,408.

Lazzarini, Louis P.: *See—*
Lazzarini, Louis P., 3,721,145.

Lazzarini, Louis P., to Hanscom, Genevieve I., 1/2 to Hanscom, Genevieve I., Magnuson, Robert, Thomson, Lois J., as Trustees of the estate of and Magnuson, Roy M. Shuffle feed positioner and cutter. 3,721,145, Cl. 83-732.000.

Lea, Harlan L., to Koneta Rubber Company, Inc. Spray shield for highway vehicle wheels. 3,721,459, Cl. 280-154.50r.

Lear Siegler, Inc.: *See—*
Bierwirth, Henry C.; and Foty, James V., 3,721,106.
Moses, Adrian J., 3,721,891.
Perfitt, Thomas E., 3,721,985.

Ledig, Kurt W.: *See—*
Wendt, Gerhard R.; Ledig, Kurt W.; and Oliver, Donald W., 3,721,688.

Lee, Art, to General Electric Company. Time delay after de-energization circuit. 3,721,832, Cl. 307-141.000.

Lee, Charles A.; and Sorrells, Frank D., to International Paper Company, mesne. Method of removing condensate from a rotary dryer. 3,721,016, Cl. 34-125.000.

Lee, David Ernest: *See—*
Chapkovich, John Steven, Jr.; and Lee, David Ernest, 3,721,415.

Lee, Henry L., Jr.: *See—*
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Lee, Max N. Y.: *See—*
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Lee Pharmaceuticals, mesne: *See—*
Stoffey, Donald G.; and Lee, Henry L., Jr., 3,721,644.

Lee, Raymond, Organization, Inc., The: *See—*
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Spies, Lillian S., 3,721,434.

Leek, Herbert Bentley: *See—*
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Lehner, Harry, to Stoba AG. Suspension shield. 3,721,028, Cl. 40-22.000.

Leibinger, Berthold; Herb, Eugen; and Klingel, Hans, to Trumpf & Co. Tool carrier construction. 3,721,154, Cl. 83-698.000.

Leitz, Ernst, G.m.b.H.: *See—*
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Reinheimer, Gunter, 3,721,827.

Lenderking, David H.: *See—*
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Lepola, Aimo Emil, to Yhtyneet Paperitehtaat Osakeyhtio. Arrangement for fixing the grinding stone in a pump grinder. 3,721,391, Cl. 241-293.000.

Lerner, Marc: *See—*
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Levin, Burton Joshua: *See—*
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Levine, Harvey: *See—*
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Levinson, Leo, to Singer Company, The. Inking device for a planar printing die plate. 3,721,187, Cl. 101-359.000.

Levolor Lorentzen, Inc.: *See—*
Debs, Victor, 3,721,285.

Lewis, Charles A.; Homza, John; Volkmer, Eldon A.; Kalaf, George P.; Coddington, Carl D.; and Zablocki, Charles J., to United States of America, Navy. Antimine pistol. 3,721,190, Cl. 102-16.000.

Lewis, Geoffrey Arthur, to Lucas, Joseph, (Industries) Limited. Fuel control system for gas turbine engines. 3,721,088, Cl. 60-39.28r.

Lewis, Peter McHigh: *See—*
Cain, Maurice Edward; Knight, Geoffrey Thomas; Gazeley, Keith Frederick; and Lewis, Peter McHigh, 3,721,659.

Leybold-Heraeus-Verwaltung GmbH: *See—*
Wilmanns, Ingo; and Barz, Alfred, 3,721,897.

Lieber, Bert, to Lust, Ernst, K.G. Partition wall. 3,721,057, Cl. 52-241.000.

Likavec, Paul F., to Chandler Evans Inc. Seal construction. 3,721,453, Cl. 277-30.000.

Lin, Chao H.: *See—*
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Lindblom, Karl Thore, to Ostbergs Fabriks AB. Sorting arrangement. 3,721,341, Cl. 209-74.00r.

Linde Aktiengesellschaft: *See—*
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Forg, Wolfgang; and Etzbach, Volker, 3,721,099.

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Liner Technology, Inc.: *See—*
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Linkroum, Irving E.: *See—*
McKeown, James E.; Linkroum, Irving E.; and Phinney, Earl M., 3,721,885.
Phinney, Earl M.; and Linkroum, Irving E., 3,721,886.

Linteris, Lino L., to Lever Brothers Company. Milk-free margarine. 3,721,570, Cl. 99-123.000.
Lippe, Joan M.; Goldfarb, Irving; and Jablon, Harry. Belt or collar with runner track. 3,721,216, Cl. 119-106.000.
List, Ferdinand; Dodt, Johann; and Alfs, Helmut, to Chemische Werke Huels, A.G. Process for the preparation of o-phthalic acid. 3,721,708, Cl. 260-524.00r.
Lithic Systems, Inc.: *See*—
Hirschfeld, Robert A., 3,721,834.
Litton Industries, Inc.: *See*—
Dunn, Elman R., 3,721,046.
Lobur, Walter, to Electronic Removal of Metals, Inc. Servomechanism feed system. 3,721,795, Cl. 219-69.00g.
Lock, Peter John; and Keve, Edward Thomas, to U.S. Philips Corporation. Ferroelectric materials and infrared detector device containing same. 3,721,628, Cl. 252-62.900.
Locke, Frank W., to Hoerner Waldorf Corporation. Two part container. 3,721,381, Cl. 229-23.00r.
Lockheed Aircraft Corporation: *See*—
Maltenieks, Otto J., 3,721,690.
Logan, Malcolm. Beverage brewing apparatus. 3,721,176, Cl. 99-280.000.
Lohse, Horst: *See*—
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Lord Corporation: *See*—
Skala, Dennis P.; and Thorn, Richard P., 3,721,417.
Lore, Raymond J.; and Draudt, Carl W., Jr. Destructive distillation of domestic sewage. 3,721,346, Cl. 210-121.000.
Losee, Kathryn Alice: *See*—
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Louderback, Charles R. Golf practice device. 3,721,447, Cl. 273-186.00e.
Louthan, Rector P.: *See*—
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Love, John J.: *See*—
Visos, Charles D.; Love, John J.; and Banes, Ralph E., 3,721,263.
Lowrance Electronics, Inc.: *See*—
Franks, Buyrl A., 3,721,124.
Loyd, Calvin D.: *See*—
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Lucas, Colin Frank, to National Research Development Corporation. Automatic recording rain gauge. 3,721,122, Cl. 73-171.000.
Lucas, Joseph, (Industries) Limited: *See*—
Allport, Maurice James, 3,721,888.
Lewis, Geoffrey Arthur, 3,721,088.
Lucich, Steve M. Chalk line holder. 3,721,009, Cl. 33-87.000.
Luetzelschwab, Wayne E., to Marathon Oil Company. Furnace having cyclically moving flames. 3,721,728, Cl. 263-2.000.
Lui, Wen-Chih: *See*—
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Lukaschewitz, Heinz Kurt; Buchmann, Johannes Walter; and Walther, Bernard Lpu, to VEB Filmfabrik Wolfen-Fotochemisches Kombinat. Plastic magazine for photosensitive sheet materials. 3,721,364, Cl. 220-41.000.
Lusignan, Henry T.: *See*—
Hucko, Henry; and Lusignan, Henry T., 3,721,946.
Lust, Ernst, K.G.: *See*—
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Lutz, Evelyn J. Boot tree. 3,720,970, Cl. 12-114.600.
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Ma, Carlton Y. W.; and Peter, John W., to Cincinnati Milacron Inc. Plastication control system for injection molding machines. 3,721,512, Cl. 425-149.000.
Machado, Joseph, to Avid Corporation. Self retractable sound plug. 3,721,313, Cl. 181-31.00r.
Machon, Raymond; Flechet, Jean; and Hugo, Etienne. Method for scouring and dyeing silk in a single operation. 3,721,522, Cl. 8-19.000.
Macioge, Frank Anthony; and Ingersoll, Henry Grant, to Cantebury Tales, Inc. Modular showcase. 3,721,484, Cl. 312-245.000.
MacKinnon, Malcolm Lain K.; and Syltebo, Bjarne E., to Boeing Company, The. Exit nozzle assemblies for gas turbine power plants. 3,721,389, Cl. 239-265.190.
Maemoto, Kenichi; Sano, Takezo; and Kobayashi, Akio, to Sumitomo Chemical Company, Limited. Method of ethylene polymerization. 3,721,721, Cl. 260-85.300.
Magna-Graphics Corporation: *See*—
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Magnuson, Robert: *See*—
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Maillard, Jacques G., to Laboratories Jacques Logeais. Oxazolidin-2-one derivatives. 3,721,675, Cl. 260-293.620.
Makower, Samuel J.; Cautilli, Philip A.; and Dickstein, Jack. Freeze-thaw stable high solids latexes of interpolymers of vinyl chloride, ethylene and certain carboxyl-containing monomers. 3,721,636, Cl. 260-29.6rw.
Malichekno, Evgeny Fedorovich: *See*—
Paton, Boris Evgenievich; Medovar, Izrailevich Boris; Latash, Jury Vadimovich; Chekotilo, Leonty Vasilievich; Baglai, Vitaly Mikhailovich; Artamonov, Viktor Leonidovich; Garkaljuk, Rodimir Ivanovich; Timchenko, Viktor Anatolievich; Malichekno, Evgeny Fedorvich; Stupak, Leonid Mikhailovich; and Dubinsky, Rudolf Solomonovich, 3,721,286.
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Malm, Assar; and Fransson, Jan-Erik, to Allmanna Svenska Elektriska Aktiebolaget. Method of manufacturing commutator segments of compound material. 3,720,998, Cl. 29-597.000.
Malmin, Oscar. Finger pad for dental instruments. 3,721,006, Cl. 32-40.00r.
Maltenieks, Otto J., to Lockheed Aircraft Corporation. Water repellent compositions of organotin and organosilicon complexes. 3,721,690, Cl. 260-429.700.
Mammel, Walter Kester, to Western Electric Company. Coanda effect switch for handling and conveying workpieces on a layer of fluid. 3,721,472, Cl. 302-31.000.
Mamoru, Hirao: *See*—
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Mann, Julius W. Self-excited composite capacitance and interlocking inductance oscillator. 3,721,920, Cl. 331-168.000.
Mannesmann Aktiengesellschaft: *See*—
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Marathon Oil Company: *See*—
Luetzelschwab, Wayne E., 3,721,728.
Maravetz, Lester L., to Esso Research and Engineering Company. Cycloalkane carboxaldoxime carbamates. 3,721,711, Cl. 260-566.0ac.
Marcey, Stephen D., to National Cash Register Company, The. Conditioning of thermoplastic compositions for bonding. 3,721,598, Cl. 156-330.000.
Maree, Michel: *See*—
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Marsh, Preston L. Crop windrowing apparatus. 3,721,080, Cl. 56-364.000.
Martin, Hulbert. Educational device. 3,721,020, Cl. 35-35.00h.
Martin-Marietta Corporation: *See*—
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Maycock, John Norman; and Witten, Louis, to Martin-Marietta Corporation. Ammonium perchlorate with cocrystallized oxalate anions. 3,721,590, Cl. 149-76.000.

Mayer, James R.; and Tipton, Joe D., to Gardner-Denver Company. Support means for mast mounted drill. 3,721,305, Cl. 173-20.000.

Mayo, Terry H., to Murphy, G. W., Industries, Inc. Drill bit bearings. 3,721,307, Cl. 175-372.000.

Mazac, Frank P.; and Fitzsimons, Alan R., to San/Bar Corporation. Ground start adapter unit. 3,721,768, Cl. 179-16.00f.

Mazzeo, Michael P.; Gobran, Riad H.; Santaniello, Anthony F.; and Gillis, Marina N., to Thiokol Chemical Corporation. One-package heat-curable urethane polymer casting composition. 3,721,647, Cl. 260-45.70r.

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McCallum, David J. Apparatus for dry cleaning and pressing. 3,721,026, Cl. 38-75.000.

McConnell, Bobby D.; Lavik, Melvin T.; and Campbell, Mahlon E., to United States of America, Air Force. Solid lubricant compositions employing polybenzimidazole resins and lubricating pigments. 3,721,625, Cl. 252-12.000.

McDonald, Patrick G., to General Motors Corporation. Multiple stage inflater. 3,721,456, Cl. 280-150.0ab.

McDonnell Douglas Corporation: *See*—
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McIntosh Laboratory, Inc.: *See*—
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McKee, James E., to Republic National Bank of Dallas, mesne. Powered roller mechanism. 3,721,130, Cl. 74-86.000.

McKeown, James E.; Linkroum, Irving E.; and Phinney, Earl M., to Bendix Corporation, The. Blasting machine with overvoltage and undervoltage protection for the energy storage capacitor. 3,721,885, Cl. 320-1.000.

McManama, Charles E. Portable sawmill having a horizontal traversing bandsaw. 3,721,146, Cl. 83-795.000.

McMorris, Edward Y., mesne: *See*—
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McMorris, Willie Mae, (Mrs.): *See*—
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McMullen, John J., Associates, Inc.: *See*—
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McNamara, Joseph P.; and Bair, Thomas G. Plated wire stack with minimized inter-bit coupling. 3,721,966, Cl. 340-174.0bc.

McNaney, Joseph T. Game of chance apparatus. 3,721,445, Cl. 273-142.00a.

McNeil Laboratories, Inc.: *See*—
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McNeill, John M. Vehicle towing device. 3,721,356, Cl. 214-86.00a.

McNulty, Daniel E.: *See*—
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Medeiros, Joseph C., to Gardberg-Medeiros Co.; d/b/a Magnetics Research Co. Multiple cassette tape duplicator with single tape transport. 3,721,450, Cl. 274-3.000.

Medovar, Izrailevich Boris: *See*—
Paton, Boris Evgenievich; Medovar, Izrailevich Boris; Latash, Jury Vadimovich; Chekotilo, Leonty Vasilievich; Baglai, Vitaly Mikhailovich; Artamonov, Viktor Leonidovich; Garkaljuk, Rodimir Ivanovich; Timchenko, Viktor Anatolievich; Malichekno, Evgeny Fedorvich; Stupak, Leonid Mikhailovich; and Dubinsky, Rudolf Solomonovich, 3,721,286.

Mehalchick, Emil J.; Mathers, James E.; and Ferri, John L., to GTE Sylvania Incorporated. Sulfur modified yttrium oxide phosphor. 3,721,630, Cl. 252-301.40s.

Meiers, Gerald Franklyn: *See*—
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Mercorelli, John. Design device. 3,721,022, Cl. 35-77.000.

Merrill, Claude I., to Dow Chemical Company, The. Fluorosulfonate compounds and method of their preparation. 3,721,694, Cl. 260-456.00a.

Merrill, Claude I., to Dow Chemical Company. Tris (difluoroamino)-methyl fluorosulfonate. 3,721,695, Cl. 260-456.00a.

Mertl, Ivan: *See*—
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Messmer, Edwin E. Drive mechanism employing suction cup coupling. 3,721,352, Cl. 214-1.0bt.

Metzger, Lenard M.: *See*—
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Meyers, Edward; Slusarchyk, Dorothy Smith; Lui, Wen-Chih; and Parker, William Lawrence, to Squibb, E. R., & Sons, Inc. Rabelomycin. 3,721,684, Cl. 260-365.000.

Meyers, George Leroy, to American Can Company. Partitioned tray. 3,721,380, Cl. 229-15.000.

Michel, Donald E.; Fairbairn, Le Roy W.; and Cook, James E., to Bendix Corporation, The. Connector for multi-conductor tape cable. 3,721,940, Cl. 339-17.00f.

Microphor, Inc.: *See*—
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Miller, Clarence O.; Welch, Floyd; deceased (by Welch, Bonnie; heiress); and McAlister, Charles G.; deceased (by McAlister, Bernice; heiress), said Miller assor. to Cities Service Company. Method of catalyst preparation. 3,721,632, Cl. 252-442.000.

Miller, Daniel D.; and Miller, Donald D., to Miller Scientific Corporation. Card grading machine. 3,721,807, Cl. 235-61.60e.

Miller, David Joseph: *See*—
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Miller, Donald D.: *See*—
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Miller, Donald G., to Canadian Patents and Development Limited. Method of drying wood. 3,721,013, Cl. 34-1.000.

Miller, Robert Boothe; and Laurie, C. Keith, to Canadian Cane Equipment Ltd. Production of livestock feed from sugarcane. 3,721,567, Cl. 99-2.0nd.

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Miller, Robert E., Jr.; and Balchunas, Anthony J., to Miller, Robert E., & Co. Indexing furniture glide. 3,720,978, Cl. 16-42.000.

Miller Scientific Corporation: *See*—
Miller, Daniel D.; and Miller, Donald D., 3,721,807.

Mima, Kiochiro, to Sony Corporation. Color television receiver. 3,721,753, Cl. 178-5.40p.

Minami, Keiichi; Nakaue, Tokuji; Susami, Kozo; Masaaki, Tabata; and Hirota, Masakazu, to Toray Industries, Inc. Method and apparatus for producing yarns by the open-end spinning system. 3,721,070, Cl. 57-58.950.

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Mitchell, Carl Rice: *See—*
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Mitchell, Thomas. Stabilizing support for back hoe. 3,721,458, Cl. 280-150.500.

Mitsubishi Chemical Industries Limited: *See—*
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Mitsubishi Monsanto Chemical Company: *See—*
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Montecatini Edison: *See—*
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Monteleone, Robert A., to United Aircraft Corporation. Blade for high speed helicopter. 3,721,507, Cl. 416-223.000.

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Montgomery, William W.; and Hood, Eugene B. T-shaped tracheal stent. 3,721,233, Cl. 128-351.000.

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Mora, Paul L.: *See—*
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Morgan-Voyce, Albert M., to Honeywell Information Systems, Inc. Apparatus for forming a multiple image laser optical memory. 3,721,965, Cl. 340-174.0yc.

Mori, Toshihiro; and Ando, Seigo, to Nippon Kokan Kabushiki Kaisha. Phase sensitive eddy current defect detector utilizing frequency doubling of detected signal prior to phase detection. 3,721,896, Cl. 324-37.000.

Morizzo, Nicholas L., to Silk City Textile Machinery Co. Shear cutting batcher apparatus. 3,721,396, Cl. 242-56.00r.

Morris, Stephen J.; and O'Keefe, James M., to Marlin Firearms Co., The. Apparatus for burn-fitting wooden gun stocks to metal receivers. 3,721,792, Cl. 219-10.570.

Morrison, Abraham; and Hetzer, Frederick C., to United Aircraft Corporation. Crossover tube construction. 3,721,089, Cl. 60-39.320.

Morton-Norwich Products, Inc.: *See—*
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Wright, George Carlin; and Yu, Chia Nien, 3,721,670.

Moses, Adrian J., to Lear Siegler Inc. Power normalized demodulator. 3,721,891, Cl. 321-47.000.

Mosher, Charles L., to Owatonna Tool Company. Spanner type tool. 3,721,137, Cl. 81-90.00b.

Moshkin, Venedikt Feofanovich: *See—*
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Moss, Philip Hotchkiss; and Cuscurida, Michael, to Jefferson Chemical Company, Inc. Starch based polyether polyols. 3,721,665, Cl. 260-233.30r.

Mostecky, Jiri: *See—*
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Hays, Robert G.; and Rhee, Chongkook, 3,721,593.
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Mott, Ludwig: *See—*
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Mott-Smith, Lewis Morton, to Mandrel Industries, Inc. Marine seismic source employing the water-hammer effect. 3,721,311, Cl. 181-.50h.

Mroz, Walter. Backlash-proof fishing reel. 3,721,399, Cl. 242-84.51r.

MTL, Incorporated: *See—*
Allison, Rudolph L.; and Lindstrand, Gary L., 3,720,991.

Mueller, Albrecht; Osieka, Hans; and Pommer, Ernst-Heinrich, to Badische Anilin & Soda-Fabrik Aktiengesellschaft. Substituted benzanilides. 3,721,709, Cl. 260-558.00d.

Mueller, Helmut; and Purcell, Lawrence N. Sealed and grounded electric motor housing. 3,721,071, Cl. 55-360.000.

Mugele, Kurt, to Siemens Aktiengesellschaft. Liquid-ring pump with control valves. 3,721,508, Cl. 417-68.000.

Muller, Albert, to Tesa S. A. Internal micrometer. 3,721,012, Cl. 33-178.00r.

Muller, Erwin: *See—*
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Muller, William G.: *See—*
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Muller-Calgan, Helmut; Unger, Richard; and Enenkel, Hans Joachim, to Merck Patent Gesellschaft mit beschrankter Haftung. Spiro cyclohexane-1,9-thioxanthenes. 3,721,672, Cl. 260-268.0pc.

Munzner, Gerald Johannes, to VEB Vereinigte Baumwollspinnerein und Zwirnerein. Process for making textured threads without twist recovery or untwisting. 3,721,082, Cl. 57-157.0ts.

Murai, Koichi; Akazome, Giichi; Choshi, Yasuo; Kobayashi, Toshiaki; and Tsuji, Atsuo, to New Japan Chemical Company Limited. Manufacture of benzylidene sorbitols. 3,721,682, Cl. 260-340.700.

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Mustain, Lewis B., to Mosler Safe Company, The. Method of checking card file activity. 3,721,343, Cl. 209-110.500.

Myer, Robert E., to Bell Telephone Laboratories, Incorporated. Detection of range marks nearest the center of a range gate. 3,721,907, Cl. 328-109.000.

Myers, Julia S.; and Wilber, Paul F. Quick detachable button. 3,720,982, Cl. 24-104.000.

Myers, Robert T. Anesthetic gas exhaust system. 3,721,239, Cl. 128-188.000.

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Nagai, Kazue: *See—*
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Nagashima, Shinichiro; and Tsuchiya, Kaichi, to Canon Inc. Organic photoconductive materials formed by condensing photoconductive and dyestuff reactant. 3,721,554, Cl. 96-1.500.

Nagy, Stanley S.: *See—*
Wilhelm, George E.; and Nagy, Stanley S., 3,721,613.

Nahm, Helmut; and Siedel, Water; deceased (by Siedel, Helene Elise; heiress), to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Phenoxyalkane-carboxylic acids, salts and esters thereof. 3,721,703, Cl. 260-471.00r.

Naito, Fumio: *See—*
Suzuki, Fumio; Naito, Fumio; and Sugaya, Shoji, 3,721,255.

Nakahara, Mitsue. Base for whetstone. 3,721,049, Cl. 51-211.00r.

Nakajima, Hitoshi; Chono, Masazumi; Taguchi, Masayoshi; Sakurai, Tokio; and Matsuo, Noriak, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for producing methacrylic acid or its esters. 3,721,705, Cl. 260-486.00d.

Nakamizo, Takefumi: *See—*
Ohyama, Masayuki; and Nakamizo, Takefumi, 3,721,892.

Nakamura, Akitoshi: *See—*
Shioya, Toshio; Nakamura, Akitoshi; Nagai, Akio; and Noguchi, Takeshi, 3,721,222.

Nakamura, Hajime, to Sansui Electric Co., Ltd. Differential amplifier having balanced current flow. 3,721,914, Cl. 330-25.000.

Nakamura, Tsutomu: *See—*
Hino, Hazime; Nakamura, Tsutomu; and Takahashi, Nobuo, 3,720,983.

Nakaue, Tokuji: *See—*
Minami, Keiichi; Nakaue, Tokuji; Susami, Kozo; Masaaki, Tabata; and Hirota, Masakazu, 3,721,070.

Nalco Chemical Company: *See—*
Bott, Lawrence L., 3,721,295.

Naphtachimie: *See—*
Bouchet, Robert, 3,721,530.

Napoli, Ruby. Board game apparatus. 3,721,443, Cl. 273-135.0aa.

Narbaits-Jaureguy, Jean Raymond. Navigating and landing device for aircraft. 3,721,499, Cl. 356-152.000.

Narco Scientific Industries, Inc.: *See—*
Wisser, William L., 3,721,941.

Narodny, Leo; and Sharpe, Louis E., to Kollsman Instrument Corporation. Synthesized hologram for an artificial optical template. 3,721,498, Cl. 356-109.000.

Naruse, Yohsuke; Utsunomiya, Kimtake; and Fuse, Yuzo, to Sony Corporation. Shadow mask having apertures at intersections of barrel-shaped and pin-cushion shaped lines. 3,721,853, Cl. 313-85.00s.

National Cash Register Company, The: *See—*

Farber, Sheldon; and Wright, Arthur John, 3,721,576.
Fellows, Charles T.; and Hermann, Stanley R., 3,721,635.
Foster, John E.; and Koo, Tuh-Kai, 3,721,962.
Marcey, Stephen D., 3,721,598.
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Lucas, Colin Frank, 3,721,122.
National Starch and Chemical Corporation: *See—*
Jarowenko, Wadym, 3,721,575.
Natural Rubber Producers' Research Association: *See—*
Cain, Maurice Edward; Knight, Geoffrey Thomas; Gazeley, Keith Frederick; and Lewis, Peter McHigh, 3,721,659.
nc.: *See—*
ons, arcr.ngld; and cncinnatmilacron nc., 372,181,007.
Needleman, Samuel. Photographic processing apparatus. 3,721,175, Cl. 95-95.000.
Neill, Donald E., to Carrier Corporation. Refrigerant compressor motor control. 3,721,880, Cl. 318-471.000.
Neipling, Lawrence E.: *See—*
Matsuo, Jon T.; and Neipling, Lawrence E., 3,721,409.
Nelsen, Arlyn Ray; and Meiers, Gerald Franklyn, to Deere & Company. Apparatus and method for converting an implement between operating and transport positions. 3,721,461, Cl. 280-415.00r.
Nelson, Bobby H., to Vetco Offshore Industries, Inc. Underwater pipe connection apparatus. 3,721,294, Cl. 166-.600.
Nelson, Stanley E. Toothbrushes. 3,720,975, Cl. 15-167.00r.
Nephew, Oliver T., to FMC Corporation. Boom extension control system. 3,721,350, Cl. 212-55.000.
New Japan Chemical Company Limited: *See—*
Murai, Koichi; Akazome, Giichi; Choshi, Yasuo; Kobayashi, Toshiaki; and Tsuji, Atsuo, 3,721,682.
Newbold, Geoffrey Tattersall: *See—*
Burton, Dennis Ernest; Newbold, Geoffrey Tattersall; Percival, Albert; Lambie, Alan James; and Sencial, Ian Robert, 3,721,678.
Newman, Norman: *See—*
Fisch, Richard; and Newman, Norman, 3,721,624.
Newman, Norman St. Paul: *See—*
Fisch, Richard S.; Newman, Norman St. Paul; and Bexell, Joel L., 3,721,563.
Newman, Walter C.; and Cohen, Andrew R., to Itek Corporation. Pulse train sorter. 3,721,905, Cl. 328-109.000.
Nickerson, Charles, to American Telephone and Telegraph Company. Battery protection circuit. 3,721,887, Cl. 320-13.000.
Nicolas, Michel: *See—*
Hardouin, Pierre; and Nicolas, Michel, 3,721,863.
Niemoth, Hubert R., to United States of America, Atomic Energy Commission. Alkali metal leak detector. 3,721,970, Cl. 340-242.000.
Niems, Lee H. Apparatus for cooling particles. 3,721,017, Cl. 34-167.000.
Nier, Johannes, to Bosch, Robert, G.m.b.H. Method of assembling transistors. 3,720,999, Cl. 29-587.000.
Nihon Denshi Kabushiki Kaisha: *See—*
Miyauchi, Sakae, 3,721,754.
Nippon Electric Company, Limited: *See—*
Kamimura, Masato; and Fukui, Saburo, 3,721,138.
Nippon Gakki Seizo Kabushiki Kaisha: *See—*
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Nippon Kokan Kabushiki Kaisha: *See—*
Mori, Toshihiro; and Ando, Seigo, 3,721,896.
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Nippon Oil Company Limited: *See—*
Imai, Hirosuke; and Matsuno, Mitsuo, 3,721,716.
Nippon Sesen Cable, Ltd.: *See—*
Nishida, Tokutaro, 3,721,431.
Nippondenso Kabushiki Kaisha: *See—*
Okada, Masashi, 3,721,221.
Nishida, Tokutaro, to Nippon Sesen Cable, Ltd. Apparatus for annealing extremely fine wires with steam. 3,721,431, Cl. 266-3.00r.
Nishimoti, Sinya: *See—*
Ueda, Kazunori; Masuo, Eiichi; Yagi, Hiroaki; and Nishimoti, Sinya, 3,721,003.
Nittan Company, Limited: *See—*
Yamada, Hayao, 3,721,840.
Noack, Rolf; and Schulze, Heinz, to VEB Pentacon, Kamera- und Kinowerke. Photographic camera. 3,721,168, Cl. 95-10.00c.
Node 4 Associates, Inc.: *See—*
Toan, Danforth W., 3,721,056.
Noguchi, Takeshi: *See—*
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Noonan, David J.: *See—*
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Nordic Cloud Corporation: *See—*
Chrisman, Ernest L., 3,721,802.
Norman, Sivert; and Hammar, Erik, to Allmanna Svenska Elektriska Aktiebolaget. Carrier member for step selectors in changers. 3,721,895, Cl. 323-43.50r.
North American Rockwell Corporation: *See—*
Jenne, Fredrick B., 3,721,963.
Shutt, Sidney G.; Hutchings, Thomas J.; and Hoffman, James T., 3,721,497.
Northern Electric Company Limited: *See—*
Cavanagh, Ronald Patrick; and Wright, Allan Richard, 3,721,382.
Croisettere, Joseph R. Marcel, 3,721,393.
Northrop Corporation: *See—*
Christensen, Albert V., 3,721,989.
Nozawa, Kazuo: *See—*
Okamoto, Noriaki; Wakabe, Teruo; and Nozawa, Kazuo, 3,721,000.
NRM Corporation: *See—*
Cantarutti, Armindo, 3,721,600.
Null, Victor G. Rotary internal combustion engine. 3,721,218, Cl. 123-8.130.
Null, William (Mrs.): *See—*
Landrum, Porter, 3,721,430.
N.V. Bekaert S.A.: *See—*
Bruggeman, Frans, 3,721,213.
Oce-van der Grinten N.V.: *See—*
Zanders, Jan H. P. A., 3,721,435.
Ogiso, Mitsutoshi, to Cannon Kabushiki Kaisha. Exposure value controlling apparatus. 3,721,167, Cl. 95-10.0ct.
Ognibene, Pietro. Portable apparatus for cleaning window-panes or the like. 3,721,502, Cl. 401-13.000.
O'Hara, Kim L.: *See—*
Beals, Charles D.; Fitzpatrick, George I.; and O'Hara, Kim L., 3,721,126.
Ohyama, Masayuki; and Nakamizo, Takefumi, to Matsushita Electric Industrial Co., Ltd. Power rectifier including a bridge rectifier circuit. 3,721,892, Cl. 321-47.000.
Oil Shale Corporation, The: *See—*
Haas, Frank C., 3,721,730.
Oishi, Hiroshi; Aoki, Fumio; Kawano, Shigeru; Kikuta, Setsuo; and Shirakawa, Masami, to Tokyo Electric Power Co., Inc., The and Osaki Electric Co., Ltd. Pulse dip carrier system using AC distribution line. 3,721,830, Cl. 307-3.000.
Oister, George K. Gated range search radar. 3,721,980, Cl. 343-9.000.
Okada, Masashi, to Nippondenso Kabushiki Kaisha. Internal combustion engine exhaust gas controlling device. 3,721,221, Cl. 123-97.00b.
Okamoto, Noriaki; Wakabe, Teruo; and Nozawa, Kazuo, to Sony Corporation. Method of making a magnetic head. 3,721,000, Cl. 29-603.000.
O'Keefe, James M.: *See—*
Morris, Stephen J.; and O'Keefe, James M., 3,721,792.
Okuda, Naoki: *See—*
Arikawa, Masayasu; Kano, Motomi; and Okuda, Naoki, 3,721,797.
Okugawa, Toshimune; and Nagai, Kazue, to Nippon Gakki Seizo Kabushiki Kaisha. Pin plate arrangement for a piano. 3,721,147, Cl. 84-188.0wp.
Okuma, Kiwamu; and Abe, Takeo, to Paramount Glass Mfg. Co., Ltd. Burner apparatus and method for manufacturing of glass wool. 3,721,538, Cl. 65-7.000.
Olechowski, Jerome Robert, to Cities Service Company. Molecular sizing technique for preparing low molecular weight copolymers of isobutylene and conjugated polymers. 3,721,660, Cl. 260-85.30r.
Olin Corporation: *See—*
Brandt, William L.; Boston, Tommy E.; and Reed, Don E., 3,721,103.
Hughes, John H.; and Duryea, Daniel F., 3,721,197.
Pryor, Michael J.; and Procter, Robin P. M., 3,721,535.
Shum, John, Jr.; Kilbourn, Dean R.; and Lin, Chao H., 3,721,032.
Oliver, Donald W.: *See—*
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Olivetti, Ing. C., & C., S.p.A.: *See—*
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Strimel, Robert S., 3,721,119.
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Olympia Werke AG: *See—*
Thevis, Paul; Schneider, Adolf; and Jakubaschk, Horst, 3,721,186.
Van Der Werf, Chien; and Theilen, Rolf, 3,721,327.
Omron Systems, Inc.: *See—*
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Omura, Yoshio: *See—*
Ueno, Saburo; Shimogo, Etsuzo; Kawasaki, Takao; Inmaru, Daisaku; Hirose, Fumio; Heya, Satoshi; Omura, Yoshio; Osaka, Yoshiaki; Fujii, Takayoshi; and Otake, Osamu, 3,721,667.
Ono, Isao: *See—*
Shiba, Tadahisa; Tsuruki, Junzo; Takahashi, Masaru; Goto, Kunihiro; and Ono, Isao, 3,721,546.
Ono, Takeshi; Hirayama, Takashi; and Yamamoto, Kimihiko, to Aisin Seiki Kabushiki Kaisha. Tension device for a sewing machine. 3,721,205, Cl. 112-254.000.
ons, arcr.ngld; and cncinnatmilacron nc. . 372,181,007, Cl. .
Opalenik, John J.: *See—*
Corey, Lawrence G.; and Opalenik, John J., 3,721,879.
Orr, Matthew F., to Poloron Products of Indiana, Inc. Power driven snow blower. 3,721,025, Cl. 34-43.00e.
Osaka, Yoshiaki: *See—*
Ueno, Saburo; Shimogo, Etsuzo; Kawasaki, Takao; Inmaru, Daisaku; Hirose, Fumio; Heya, Satoshi; Omura, Yoshio; Osaka, Yoshiaki; Fujii, Takayoshi; and Otake, Osamu, 3,721,667.
Osaki Electric Co., Ltd.: *See—*

Oishi, Hiroshi; Aoki, Fumio; Kawano, Shigeru; Kikuta, Setsuo; and Shirakawa, Masami, 3,721,830.

Osieka, Hans: *See—*
Mueller, Albrecht; Osieka, Hans; and Pommer, Ernst-Heinrich, 3,721,709.

Ostbergs Fabriks AB: *See—*
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Oster Corporation: *See—*
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Ostermeier, Heinrich: *See—*
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Osthoff, Walter. Gas fueled singeing burner for flat textiles. 3,721,517, Cl. 431-353.000.

Otake, Osamu: *See—*
Ueno, Saburo; Shimogo, Etsuzo; Kawasaki, Takao; Inmaru, Daisaku; Hirose, Fumio; Heya, Satoshi; Omura, Yoshio; Osaka, Yoshiaki; Fujii, Takayoshi; and Otake, Osamu, 3,721,667.

Otteson, Christian S.: *See—*
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Ottle, Robert E.: *See—*
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Otto, Dr. C., & Comp. Gesellschaft mit beschrankter Haftung: *See—*
Spindeler, Heinrich, 3,721,609.

Overton, Marvin C., III: *See—*
Ziernicki, Robert S., 3,721,230.

Owatonna Tool Company: *See—*
Mosher, Charles L., 3,721,137.

Owens-Illinois, Inc.: *See—*
Atkinson, Everett J.; Sager, James R.; and Bensch, Alan C., 3,721,501.
Hammer, Friedrich W., 3,721,540.
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Package Machinery Company: *See—*
Roberts, Franklin B.; and Groom, James S., 3,721,375.

Packard Instrument Company, Inc.: *See—*
Bristol, Stanley M., 3,721,824.

Page, Robert H.: *See—*
De Santis, Michael J.; Page, Robert H.; and Rakowsky, Edward L., 3,721,257.

Pagliaro, Salvatore. Scale for upright pianos. 3,721,149, Cl. 84-197.000.

Palmer, Darrell D.: *See—*
Englert, Ralph A.; Fasano, Ronald F.; and Palmer, Darrell D., 3,721,967.

Palopoli, Frank P.; and Benson, Harvey D., to Richardson-Merrell Inc. Aminoalkoxy-or aminomethyl triarylalkenones. 3,721,712, Cl. 260-570.00r.

Panzer, Norman. Obturator device for hysterosalpingography and the like. 3,721,229, Cl. 128-2.00a.

Panzeri, Cesare: *See—*
D'Addea, Nunzio; Panzeri, Cesare; and Chiappulini, Ruggero, 3,721,158.

Paoli, Alfred, to Hubbell, Harvey, Incorporated. Filter contact connector assembly with contact pins having integrally constructed capacitors. 3,721,869, Cl. 317-256.000.

Paradise, Ronald Y.: *See—*
Brinkman, John D.; Paradise, Ronald Y.; and Prill, Robert S., 3,721,975.

Paramount Glass Mfg. Co., Ltd.: *See—*
Okuma, Kiwamu; and Abe, Takeo, 3,721,538.

Paret, Giancarlo; and Cinelli, Ermanno, to Snam Progetti S.p.A. Process for the extraction of aromatic hydrocarbons. 3,721,620, Cl. 208-317.000.

Parker, William Lawrence: *See—*
Meyers, Edward; Slusarchyk, Dorothy Smith; Lui, Wen-Chih; and Parker, William Lawrence, 3,721,684.

Parks, Argus F.; and Darnell, Byron G., to Esco Manufacturing Company. Pothead construction and method of terminating a power cable therewith. 3,721,745, Cl. 174-19.000.

Parks, Jerry K., to United States of America, Army. Optical image scanner utilizing variable index of refraction fiber optics. 3,721,828, Cl. 250-220.00r.

Parrot, Jean-Marc: *See—*
Classen, Franz; and Parrot, Jean-Marc, 3,721,543.

Passalenti, Beppino: *See—*
Vargiu, Silvio; and Passalenti, Beppino, 3,721,643.

Patent-Treuhand-Gesellschaft fur elektrische Gluhlampen mbH: *See—*
Vatterodt, Karl; and Weiss, Werner, 3,721,744.

Patience, Donald, to Kendall Company, The. Conformable disposable garment. 3,720,957, Cl. 2-114.000.

Paton, Boris Evgenievich; Medovar, Izrailevich Boris; Latash, Jury Vadimovich; Chekotilo, Leonty Vasilievich; Baglai, Vitaly Mikhailovich; Artamonov, Viktor Leonidovich; Garkaljuk, Rodimir Ivanovich; Timchenko, Viktor Anatolievich; Malichekno, Evgeny Fedorvich; Stupak, Leonid Mikhailovich; and Dubinsky, Rudolf Solomonovich. Method of obtaining hollow metal ingots by electroslag remelting. 3,721,286, Cl. 164-52.000.

Patsalos, Peter C.: *See—*
Baltsas, Stavros; and Patsalos, Peter C., 3,721,444.

Paugh, Edward C., to International Telephone and Telegraph Corporation. Electrical connector. 3,721,939, Cl. 339-14.00r.

Paul, Edward L.: *See—*
Klink, Arthur E.; and Paul, Edward L., 3,721,822.

Paul, Gerard T.: *See—*
Condon, Richard D.; Gill, Harry A.; Noonan, David J.; and Paul, Gerard T., 3,721,813.

Pawlitzki, Rainer, to Siemens Aktiengesellschaft. Rapid disconnection clutch for nuclear reactor control rods. 3,721,462, Cl. 287-119.000.

Paxton-Mitchell: *See—*
Sholl, Arthur F.; Wolfe, Donald L.; and Benitez, Armando R., 3,721,267.

Payne, Robert A.: *See—*
Jenifer, Richard M.; Payne, Robert A.; and Sobchak, Frank L., 3,721,974.

Paynter, Julian L. Method for cigarette making. 3,721,247, Cl. 131-72.000.

Paynter, Julian L. Cigarette making apparatus. 3,721,248, Cl. 131-72.000.

Peacock, Peter J.: *See—*
Scarnato, Thomas J.; Peacock, Peter J.; Cicci, George B.; Krage, Paul W.; and Kowalik, John J., 3,721,073.

Peeters, Hugo Karel: *See—*
Laridon, Urbain Leopold; Delzenne, Gerard Albert; and Peeters, Hugo Karel, 3,721,566.

Pelenc, Yves; and Gatellet, Jacques, to Gerin, Merlin, Societe Anonyme. Linear induction motor propulsion system. 3,721,874, Cl. 318-135.000.

Peltz, Leslie J.: *See—*
Robinson, La Roy E.; and Peltz, Leslie J., 3,721,139.

Penniman, Robert, to Barreca Products Co. Ski boot carrier. 3,721,373, Cl. 224-5.00z.

Percifield, Edward K.: *See—*
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Percival, Albert: *See—*
Burton, Dennis Ernest; Newbold, Geoffrey Tattersall; Percival, Albert; Lambie, Alan James; and Sencial, Ian Robert, 3,721,678.

Perfitt, Thomas E., to Lear Siegler, Inc. Navigational system. 3,721,985, Cl. 343-103.000.

Perilhou, Jean Robert: *See—*
Auphan, Michel Joseph; and Perilhou, Jean Robert, 3,721,758.

Perina, Joseph, to American Velcro, Inc. Modular grid panel retention system. 3,721,050, Cl. 52-28.000.

Perkin-Elmer Corporation, The: *See—*
Condon, Richard D.; Gill, Harry A.; Noonan, David J.; and Paul, Gerard T., 3,721,813.

Peroy, Francois, to Regie Nationale des Usines Renault and Automobiles Peugeot. Delayed-opening switches for vehicles interior lighting. 3,721,933, Cl. 337-66.000.

Pessolano, Arsenio A.: *See—*
Witzel, Bruce E.; Shen, Tsung-Ying; Graham, Patricia M.; Clark, Robert L.; and Pessolano, Arsenio A., 3,721,676.

Peter, John W.: *See—*
Ma, Carlton Y. W.; and Peter, John W., 3,721,512.

Peterson, Donald William: *See—*
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Petro-Tex Chemical Corporation: *See—*
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Petrol Injection Limited: *See—*
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Pettibone Corporation: *See—*
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Philadelphia Gear Corporation: *See—*
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Philco-Ford Corporation: *See—*
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Phillipps, Gordon Hanley: *See—*
Elks, Joseph; Phillipps, Gordon Hanley; and May, Peter John, 3,721,687.

Phillips Petroleum Company: *See—*
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Campbell, Robert W., 3,721,653.
Chapman, Charles C.; Cannady, William P.; and Van Pool, Joe, 3,721,720.
Collie, Stafford D., 3,721,360.
Harris, Michael R., 3,721,514.
Hughes, William B.; and Zuech, Ernest A., 3,721,718.
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Remke, Marvin A., 3,721,253.
Ruehlen, Forrest N., 3,721,619.

Philofsky, Elliott: *See—*
Black, James R.; and Philofsky, Elliott, 3,720,997.

Phinney, Earl M.: *See—*
McKeown, James E.; Linkroum, Irving E.; and Phinney, Earl M., 3,721,885.

Phinney, Earl M., to Bendix Corporation, The. Blasting machine having a manually operable permanent magnet generator and anti-demagnetization circuit. 3,721,860, Cl. 317-80.000.

Phinney, Earl M.; and Linkroum, Irving E., to Bendix Corporation, The. Blasting machine with overvoltage and undervoltage protection for the energy storage capacitor. 3,721,886, Cl. 320-1.000.

Picard, Karl Heinz; and Eggert, Horst, to Siemens Aktiengesellschaft. Pressure switch device having a pressure-dependent circuit for a compressor. 3,721,785, Cl. 200-148.00b.

Picard, Roland: *See—*
Blattner, Karl; and Picard, Roland, 3,721,164.

Pickford, Allan E.: *See—*
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Piedmont Engineering and Machine Company, Inc.: *See—*
Christian, Donald K.; and Minchey, Jerry M., 3,721,376.

Pielkenrood, Jacob; Ambrosius, Willem L. B.; and Kooistra, Willem, to Pielkenrood-Vinitex N.V. Purification device for removing heavy components from a suspension. 3,721,347, Cl. 210-519.000.
Pielkenrood-Vinitex N.V.: *See—*
Pielkenrood, Jacob; Ambrosius, Willem L. B.; and Kooistra, Willem, 3,721,347.
Pierce, Don C., Jr., to Huron Products Company. Combination lock bank. 3,721,384, Cl. 232-4.00r.
Pierdet, Andre: *See—*
Jolly, Jean; and Pierdet, Andre, 3,721,685.
Pierrot, Victor Charles, III: *See—*
French, John Lischer; Kessler, Kenneth Quentin; Funk, Welker W.; Pierrot, Victor Charles, III; and Hiseler, Stanley Robert, 3,721,280.
Piester, Leroy E.; and Royal, Robert E., to Centuri Engineering Company, Inc. Multi-stage model rocket assembly. 3,721,193, Cl. 102-34.500.
Pieuchard, Guy; Flamand, Jean; and Labeyrie, Antoine, to JOBIN-YvON,. Optical diffraction grating scanner device. 3,721,487, Cl. 350-7.000.
Pin-Set Corporation: *See—*
Elders, Gerald W.; Schneider, Thomas E.; and Alongi, John R., 3,721,094.
Pincus, Ralph M., to Bendix Corporation, The. Phase and frequency comparator for signals unavailable simultaneously. 3,721,909, Cl. 328-133.000.
Pioneer Industries; division of SOS Consolidated Inc.: *See—*
Jerchower, Lewis A., 3,721,055.
Pituch, Thomas R.; Truesdell, Stanley E.; and Winston, Brian W., to Avery Products Corporation. Address labeler means. 3,721,601, Cl. 156-542.000.
Plessey Handel und Investments A.G.: *See—*
Reed, Alan, 3,721,796.
Polaroid Corporation: *See—*
Downey, Rogers B., 3,721,491.
Fitzgerald, Maurice J., 3,721,565.
Johnson, Bruce K., 3,721,169.
Johnson, Bruce K., 3,721,170.
Land, Edwin H., 3,721,562.
Pollard, Henry L.: *See—*
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Pollutrol Industries, Inc.: *See—*
Rost, Kai Leonart, 3,721,344.
Polonsky, Samuel: *See—*
Boyles, Robert L.; and Polonsky, Samuel, 3,721,087.
Poloron Products of Indiana, Inc.: *See—*
Orr, Matthew F., 3,721,025.
Polukhin, Valery Vasilievich: *See—*
Skachko, Jury Nikolaevich; Moshkin, Venedikt Feofanovich; Garkaljuk, Rodimir Ivanovich; Popov, Nikolai Vladimirovich; Polukhin, Valery Vasilievich; Korshunov, Igor Illarionovich; Bokov, Vladimir Mikhailovich; and Skorudsky, Boris Pavlovich, 3,721,793.
Poly-Optics, Inc.: *See—*
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Pommer, Ernst-Heinrich: *See—*
Mueller, Albrecht; Osieka, Hans; and Pommer, Ernst-Heinrich, 3,721,709.
Popov, Nikolai Vladimirovich: *See—*
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Porter, James M., to Trane Company, The. High pressure multiple pump for absorption refrigeration machine. 3,721,109, Cl. 62-476.000.
Porter, Norman: *See—*
Kugler, Carl J.; and Porter, Norman, 3,721,125.
Pot, Francois: *See—*
Boel, Charles; Pot, Francois; and Sachot, Claude, 3,721,052.
PPG Industries, Inc.: *See—*
Tarnopol, Milton S.; and Snyder, Thomas P., 3,721,594.
Tarnopol, Milton S.; and Snyder, Thomas P., 3,721,595.
Practical Innovations, Inc.: *See—*
Martinsen, Lyle J., 3,721,573.
Prediger, Fred Robert; and Kniazuk, Michael, to Merck & Co., Inc. Device for the evaluation of decongestant drugs. 3,721,228, Cl. 128-2.00r.
Price, John E.: *See—*
Barrett, John C.; Bergh, Arndt B.; Price, John E.; and Hornak, Tomas, 3,721,964.
Prill, Robert S.: *See—*
Brinkman, John D.; Paradise, Ronald Y.; and Prill, Robert S., 3,721,975.
Prince, Jack M., to ESB Incorporated. Removeable protective side shield assembly for mounting on spectacles. 3,721,490, Cl. 351-47.000.
Process Shizai Company Limited: *See—*
Inoue, Nobuyuki, 3,721,557.
Procter, Robin P. M.: *See—*
Pryor, Michael J.; and Procter, Robin P. M., 3,721,535.
Proctor & Schwartz, Inc.: *See—*
Wilson, Jack P., 3,721,568.
Pryor, Michael J.; and Procter, Robin P. M., to Olin Corporation. Composite copper alloy. 3,721,535, Cl. 29-199.000.
PSI Products, Inc.: *See—*
Black, Bobby E., 3,721,452.
Pugh, Paul F. High voltage cable splicing and terminating methods. 3,721,002, Cl. 29-628.000.
Purcell, Lawrence N.: *See—*
Mueller, Helmut; and Purcell, Lawrence N., 3,721,071.
Putz, Antide: *See—*
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Questor Corporation: *See—*
Rawlings, John H., 3,720,955.
Quinto, Mario J. Refuse compacting device. 3,721,060, Cl. 53-124.00b.
R. K. S.: *See—*
Dubost, Jacques Leon Francois, 3,720,987.
Raab, Andrew F., to Indak Manufacturing Corporation. Sliding action electrical switch with ramp portions between contacts and insulating strips. 3,721,779, Cl. 200-16.00c.
Rachem Corporation: *See—*
Clabburn, Robin James Thomas, 3,721,749.
Rademaker, Leo C.; and Hill, Ezra C., to General Electric Company. Plastic case power supply. 3,721,865, Cl. 317-120.000.
Radiation Research Corporation: *See—*
Barnes, Carl E., 3,721,652.
Rafael, Aruth: *See—*
Willach, Rudolf; and Rafael, Aruth, 3,721,217.
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Rakowsky, Edward L.: *See—*
De Santis, Michael J.; Page, Robert H.; and Rakowsky, Edward L., 3,721,257.
Rambausek, Hugo, to Heidelberger Druckmaschinen Aktiengesellschaft. Device for hot embossing with colored roll foils. 3,721,185, Cl. 101-25.000.
Ramond, Pierre A., to Regie Nationale des Usines Renault. Gear cutting methods. 3,720,989, Cl. 29-159.200.
Ranauto, Humbert J., to Atlas Chemical Industries, Inc. Aqueous built liquid detergents containing alkyl glycosides. 3,721,633, Cl. 252-527.000.
Rand, Sidney, to Commonwealth of Puerto Rico, Government of the. Machine for polishing masonry floors. 3,721,048, Cl. 51-174.000.
Randau, Helmut Klaus; and Taphorn, Bodo Egon, to Volkswagenwerk Aktiengesellschaft. Distributor. 3,721,223, Cl. 123-102.000.
Rapidograph, Inc.: *See—*
Anderka, Gerold, 3,721,011.
Raschke, Herbert A., to Bullard, E. D., Company. Face shield. 3,720,956, Cl. 2-8.000.
Rasmussen, John Oscar, Jr. Method and apparatus for analysis of liquid residues using nuclear reactions. 3,721,825, Cl. 250-83.30r.
Rasnick, William H.; and Steger, Philip J., to United States of America, Atomic Energy Commission. Gas bearing and method of making same. 3,721,479, Cl. 308-9.000.
Rauscher, David Albert; and Alexander, Robert Warren, to Carolina Steel and Wire Corporation. Method and apparatus for splicing jacketed cable. 3,721,277, Cl. 140-111.000.
Rawlings, John H., to Questor Corporation. Football helmet. 3,720,955, Cl. 2-3.00r.
Raynes, Burt F.; Kanatsiz, Necati; and Ottle, Robert E., to Rohr Industries Inc. Materials handling system. 3,721,354, Cl. 214-38.00d.
RCA Corporation: *See—*
Barkow, William Henry; and Gross, Josef, 3,721,930.
Berson, Bertrand Edward; and Upadhyayula, Chainulu Lakshminarsimha, 3,721,924.
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Gibson, John James; and Peterson, Donald William, 3,721,990.
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Reding, John T.; and Barnett, David W., to Dow Chemical Company, The. Aluminum sacrificial anode. 3,721,618, Cl. 204-197.000.
Redinger, Volker, to Hellerich, Robert, K.G. Eutingen. Process and apparatus for making polygonal spectacle glass rims. 3,721,275, Cl. 140-88.000.
Reed, Alan, to Plessey Handel und Investments A.G. Welding electrodes. 3,721,796, Cl. 219-119.000.
Reed, Don E.: *See—*
Brandt, William L.; Boston, Tommy E.; and Reed, Don E., 3,721,103.
Reed, Frank J., Jr.: *See—*
Reed, Frank J., Sr.; and Reed, Frank J., Jr., 3,721,957.
Reed, Frank J., Sr.; and Reed, Frank J., Jr. Flashing toy road barrier having folding legs. 3,721,957, Cl. 340-114.00r.
Reese, James D. Portable lamp. 3,721,516, Cl. 731-202.000.
Regie Nationale des Usines Renault: *See—*
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Reilly, James P., to Avco Corporation. Electrically excited flowing gas laser and method of operation. 3,721,915, Cl. 331-94.500.

Reinhard, Paul, to Teppichfabrik Melchnau AG. Method and apparatus for fabricating pile goods. 3,721,372, Cl. 223-30.000.

Reinheimer, Gunter, to Leitz, Ernst, G.m.b.H. Arrangement for automatically focussing an optical instrument. 3,721,827, Cl. 250-201.000.

Reinhold, Donald F.; Sletzinger, Meyer; and Chemerda, John M., to Merck & Co., Inc. Resolution of DL-α-lower alkanoylamino-α-(benzyl) propionitriles. 3,721,697, Cl. 260-465.00d.

Reiser, Hans Joachim, to Kabel- und Metallwerke Gutehoffnungshutte Aktiengesellschaft. Apparatus for uncoiling wire from a spool. 3,721,394, Cl. 242-254.00r.

Remke, Marvin A., to Phillips Petroleum Company. Controlling apparatus and method. 3,721,253, Cl. 137-3.000.

Renskers, John O., to Coilcraft, Inc. Dual in-line package. 3,721,747, Cl. 174-52.0pe.

Republic National Bank of Dallas, mesne: *See—*
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Republic Steel Corporation: *See—*
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Restaurant Technology, Inc.: *See—*
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Reynolds Guyer Agency of Design: *See—*
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Reynolds, James Francis: *See—*
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Reynolds Metals Company: *See—*
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Reynolds, Michael E. Building block of empty cans. 3,721,059, Cl. 52-760.000.

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Hays, Robert G.; and Rhee, Chongkook, 3,721,593.

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Conseiller, Yvon G. M.; and Fontaine, Gerrard J., 3,721,669.

Rice, Henry T. M. Boat trailer. 3,720,967, Cl. 9-1.00t.

Richardson, Gerald A.: *See—*
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Tilford, Charles Harmon, 3,721,673.

Richmond, Nelson R., to Kaman Aerospace Corporation. Free wheeling coupling. 3,721,325, Cl. 192-67.00a.

Rickard, Donn J.: *See—*
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Dimmick, Roger F.; Lagergren, Richard E.; Markley, Robert F.; Ricklefs, Merlin J.; and Schaffer, Walter S., 3,721,808.

Riedel, Hans-Jurgen, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Method of extracting uranium from seawater. 3,721,533, Cl. 23-337.000.

Ries, Gordon E. Light unit. 3,721,814, Cl. 240-10.00r.

Rippel, Wally E. Current limited transistor switch. 3,721,836, Cl. 307-253.000.

Ristow, Harold E. Dial indicator gage. 3,721,010, Cl. 33-172.00r.

Roberson, Elbert Belmont, Jr., to Du Pont de Nemours, E. I., and Company. Multi-end knit-deknit process. 3,720,984, Cl. 28-72.160.

Roberts, Franklin B.; and Groom, James S., to Package Machinery Company. Web feed mechanism for wrapping machines. 3,721,375, Cl. 225-96.000.

Roberts, John T., to Grace, W. R., & Co. Bag packaging system. 3,721,062, Cl. 53-385.000.

Robertshaw Controls Company: *See—*
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McIntosh, Harold A., 3,721,866.

Robertson, H. H., Company: *See—*
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Robicheaux, Thomas A.; and Ford, Clyde G., to International Paper Company. Barrier attachment for gas chromatograph. 3,721,065, Cl. 55-67.000.

Robin, Edward L. Battery terminal guard. 3,721,947, Cl. 339-116.00r.

Robinson, La Roy E.; and Peltz, Leslie J., to Continental Machines, Inc. Automatic control for return motion of cutoff saw head. 3,721,139, Cl. 83-63.000.

Robinson, William J., to Reynolds Guyer Agency of Design. Display stand. 3,721,413, Cl. 248-174.000.

Rocket Research Corporation: *See—*
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Rockwell Manufacturing Company: *See—*
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Roessler, Walter E., to Gulf Oil Corporation. Duel dry chemical fire extinguisher. 3,721,299, Cl. 169-31.00p.

Rogers, George W., to Allis-Chalmers Corporation. Vehicle brake control system with safety parking feature. 3,721,474, Cl. 303-9.000.

Rohr Corporation: *See—*
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Rohr Industries Inc.: *See—*
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Rohr, Otto; Ebner, Ludwig; Dittrich, Volker; and Siegle, Heinz, to Ciba-Geigy AG. Combatting phytopathogenic fungi on plants with sub-phytoloxic fungicidally effective amounts of herbicidal N-phenyl derivatives of 3,5-dihalosalicylaldehyde. 3,721,741, Cl. 24-330.000.

Rolnick, Benjamin: *See—*
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Romack, Paul L.: *See—*
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Rosan Engineering Corporation: *See—*
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Rosan, Jose, Jr.: *See—*
Rosan, Jose, Sr.; and Rosan, Jose, Jr., 3,720,969.

Rosan, Jose, Sr.; and Rosan, Jose, Jr., said Rosan, Jose, Jr., assor to Rosan Engineering Corporation. Method of making a stud fastener assembly with integral lock ring. 3,720,969, Cl. 10-27.000.

Rosen, Arye; and Reynolds, James Francis, to RCA Corporation. Negative resistance semiconductor coupled transmission line apparatus. 3,721,918, Cl. 331-96.000.

Rosen, Irving: *See—*
Uebele, Curtis E.; Griffith, Russell K.; and Rosen, Irving, 3,721,724.

Rosen, Sidney. Relating to nails. 3,721,153, Cl. 85-11.000.

Rosendall, Henry J., to Bissell Inc. Floor sweeper handle-to-housing connection. 3,720,974, Cl. 15-144.00r.

Rosenthal, Charles William: *See—*
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Ross, Gerald F., to Sperry Rand Corporation. Short time electromagnetic wave signal sampling system. 3,721,912, Cl. 328-151.000.

Ross, Will, Inc.: *See—*
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Rost, Kai Lennart, to Pollutrol Industries, Inc. Apparatus for treating waste water. 3,721,344, Cl. 210-104.000.

Roumagnac, Michel, to La Telemecanique Electrique. Triggering device for switchgear. 3,721,782, Cl. 200-47.000.

Roussel-UCLAF: *See—*
Jolly, Jean; and Pierdet, Andre, 3,721,685.

Rowan, Richard L.: *See—*
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Royal, Robert E.: *See—*
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Rozenboom, Gustave, to Square D Company. Electrical panelboard with stacked bus bars and mounting pan formed of grooved bars. 3,721,864, Cl. 317-119.000.

Rudolph, Hans; and Ye, Richard C., to Rudolph, Hans, Inc. Jaw exercising device. 3,721,439, Cl. 272-83.00r.

Rudolph, Hans, Inc.: *See—*
Rudolph, Hans; and Ye, Richard C., 3,721,439.

Rudszinat, Willy: *See—*
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Ruehlen, Forrest N., to Phillips Petroleum Company. Electrolytic cell. 3,721,619, Cl. 204-272.000.

Rufer, Clemens; Albrecht, Rudolf; Kessler, Hans-Joachim; and Schroder, Eberhard, to Schering A.G. Novel 5-nitro-imidozole antimicrobially effective compounds. 3,721,668, Cl. 260-240.00j.

Rutherford, Walter H.: *See—*
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Rutten, Pierre L., to Compagnie Nationale d'Amenagemt de la Region du Bas-Rhode Languedoc. Device for automatically driving an irrigation installation. 3,721,254, Cl. 137-78.000.

Ryan, Merle E.; and Stremel, William D., to Bendix Corporation, The. Crush dressing control mechanism. 3,721,047, Cl. 51-165.780.

Saal, Frederick Alan: *See—*
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Sabine Manufacturing, Inc.: *See—*
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Sachot, Claude: *See—*
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Sager, James R.: *See—*
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Saito, Chiharu: *See—*
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Salem Corporation: *See—*
Wilt, Charles R., Jr., 3,721,518.

Saller, Erik; and Trechock, Jack, to FMC Corporation. Fluidizing devices for fluid beds, with in-process cleaning. 3,721,608, Cl. 202-241.000.
Samrok, Fred E.; and Higgins, William E., to Westinghouse Air Brake Company. Railroad lift bridge remote control system. 3,721,819, Cl. 246-118.000.
San/Bar Corporation: *See—*
Mazac, Frank P.; and Fitzsimons, Alan R., 3,721,768.
Sandt, Gerhardt; and Ostermeier, Heinrich, to Datagraph AG. Apparatus for selecting an index card of sheet-like form. 3,721,342, Cl. 209-80.500.
Sano, Takezo: *See—*
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Sansui Electric Co., Ltd.: *See—*
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Santaniello, Anthony F.: *See—*
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Sartor, Raymond Watkins, to Dresser Industries, Inc. Pressure equalizing system for rock bits. 3,721,306, Cl. 175-228.000.
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Saunders Valve Company Limited: *See—*
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Saunders, William Thomas, to American Can Company. Full easy open and reclosable metal container. 3,721,365, Cl. 220-47.000.
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Scarnato, Thomas J.; Peacock, Peter J.; Cicci, George B.; Krage, Paul W.; and Kowalik, John J., to International Harvester Company. Method of processing, positioning and aerating crops. 3,721,073, Cl. 56-1.000.
Schafer, Thomas W., to Rohr Corporation. Chuck. 3,721,092, Cl. 60-54.50h.
Schaffer, Philip O.; Hoverter, Bryce E.; and Haas, Kenneth C., to Teledyne, Inc. Automatic needle positioning and presser foot lifting mechanism. 3,721,204, Cl. 112-218.00r.
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Dimmick, Roger F.; Lagergren, Richard E.; Markley, Robert F.; Ricklefs, Merlin J.; and Schaffer, Walter S., 3,721,808.
Schalin, Edmund; Dietrich, Joseph J.; Sturm, Clarence L.; Berkey, Reynold A.; and Semancik, John R., to Diamond Shamrock Corporation. Polymerizable unsaturated polyester composition containing thermoplastic additive. 3,721,642, Cl. 260-40.00r.
Schallehn, Hans-Georg, to Rheinstahl Aktiengesellschaft. Armored vehicle turret. 3,721,156, Cl. 89-36.00k.
Scheiner, Solly: *See—*
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Schering A.G.: *See—*
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Laurent, Henry; Kolb, Karl Heinz; and Wiechert, Rudolf, 3,721,686.
Schierz, Winfried, to SEMIKRON Gesellschaft fur Gleichrichterbau und Elektronik m.b.H. Tablet-shaped semiconductor component and process for its manufacture. 3,721,867, Cl. 317-234.00r.
Schiff, Leonard Norman; and Staras, Harold, to RCA Corporation. Disabled vehicle signalling system. 3,721,955, Cl. 340-33.000.
Schild, A., S.A.: *See—*
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Schindler, Walter; and Zust, Armin, to Ciba-Geigy Corporation. Imidazolidinone derivatives in a composition and method for producing C.N.S. depressant. 3,721,739, Cl. 424-250.000.
Schlienger, Max P. Rotating arc furnace crucible. 3,721,511, Cl. 425-8.000.
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Schlumbom, Peter; and Gordon, David A., to Ciba-Geigy Corporation. Process for preparing copolymers of maleic anhydride and 2-alkoxypropene. 3,721,654, Cl. 260-78.50r.
Schlumbom, Peter; and Gordon, David A., to Ciba-Geigy Corporation. Copolymers of halfesters of maleic anhydride and-alkoxypropene. 3,721,655, Cl. 260-78.50t.
Schmader, Joseph M. Method and apparatus for removing worms and parasites from the flesh of fish. 3,720,981, Cl. 17-45.000.
Schmid, Julius, Inc.: *See—*
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Schmidlin, Albertus E., to United States of America, Army. Apparatus for converting pressure energy to thermal energy. 3,721,521, Cl. 432-227.000.
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Schmidt, Dana M., to United States Gypsum Company. Freight restraining bar. 3,721,200, Cl. 105-369.00b.
Schmidt, Ralph Otto, to Interstate Electronics Corporation. Fast fourier transform computer and method for simultaneously processing two independent sets of data. 3,721,812, Cl. 235-156.000.
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Schneider, George W., to Singer Company, The. Adjustable diameter roller bearing. 3,721,483, Cl. 308-196.000.
Schneider, Robert H.; and Schutt, John B. Silicate coatings compositions. 3,721,574, Cl. 106-74.000.
Schneider, Thomas E.: *See—*
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Schneiderman, Abraham; and Wechsler, George G., to Viewlex, Inc. Audio visual means. 3,721,493, Cl. 353-19.000.
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Schofield, Norman W.: *See—*
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Schreiner, Horst; and Hassler, Heinrich, to Siemens Aktiengesellschaft. Process for producing a heterogenous penetration-bonded metal. 3,721,550, Cl. 75-208.00r.
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Schuller, Peter. Electric temperature regulator. 3,721,937, Cl. 337-335.000.
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Sugaya, Shoji: *See—*
Suzuki, Fumio; Naito, Fumio; and Sugaya, Shoji, 3,721,255.

Sugiyama, Hironari; Yoshinaga, Eiichi; and Itoh, Hideo, to Kumiai Chemical Industry Co., Ltd. Certain phosphates and their utilization as fungicides. 3,721,736, Cl. 424-217.000.

Suld, George; and Urban, Ralph L., to Sun Oil Company. Disproportionation of toluene or xylene. 3,721,717, Cl. 260-672.00t.

Sumi, Kiyoshi; and Asakura, Osamu, to Shinyei Kaisha. Humidity sensors comprising alkali metal oxide, divanadium pentoxide and silicon. 3,721,631, Cl. 252-408.000.

Sumitomo Chemical Co., Ltd.: *See—*
Yamamoto, Hisao; Inaba, Shigeho; Arasaki, Seitetsu; Aruyama, Isamu; Takahashi, Kei; Saito, Chiharu; and Sakai, Shigeru, 3,721,671.

Sumitomo Chemical Company, Limited: *See—*
Maemoto, Kenichi; Sano, Takezo; and Kobayashi, Akio, 3,721,721.

Sun Oil Company: *See—*
Suld, George; and Urban, Ralph L., 3,721,717.

Sundberg, Garald C.; and Swensen, Eugene T., to Honeywell Inc. Speed monitoring apparatus. 3,721,973, Cl. 340-263.000.

Sunstein, David E. Cathode-ray tube and system to eliminate electrical discharges during indexing. 3,721,854, Cl. 315-21.00c.

Supper, Charles, Company, Incorporated: *See—*
Thomas, Roy L., Jr., 3,721,826.

Susa, Ermanno. Process for producing polyisobutene. 3,721,661, Cl. 260-94.800.

Susami, Kozo: *See—*
Minami, Keiichi; Nakaue, Tokuji; Susami, Kozo; Masaaki, Tabata; and Hirota, Masakazu, 3,721,070.

Suzuki, Fumio; Naito, Fumio; and Sugaya, Shoji, to Sanyo Electric Co., Ltd. Fluidic device. 3,721,255, Cl. 137-807.000.

Sweeney, William A.: *See—*
Straus, Alan E.; Sweeney, William A.; House, Ralph; and Sharman, Samuel H., 3,721,707.

Swenck, George F.: *See—*
Vickstrom, Donald E.; and Swenck, George F., 3,721,215.

Swensen, Eugene T.: *See—*
Sundberg, Garald C.; and Swensen, Eugene T., 3,721,973.

Syltebo, Bjarne E.: *See—*
MacKinnon, Malcolm Lain K.; and Syltebo, Bjarne E., 3,721,389.

Sylvania Electric Products, Inc.: *See—*
Chiola, Vincent; Smith, James S.; and Vanderpool, Clarence D., 3,721,852.

Symoniak, Martin F.; and Lee, Max N. Y., to Union Carbide Corporation. Isothermal process for olefin separation. 3,721,064, Cl. 55-62.000.

Sysun, Viktor Viktorovich: *See—*
Sereda, Nikolai Ivanovich; Sysun, Viktor Viktorovich; Skvortsov, Boris Vasilievich; Fisher, Viktor Davydovich; and Tolstoshev, Alexandr Vasilievich, 3,721,917.

Szabrak, Robert H.; and Smith, Richard A., to Stein, Sam, Associates, Inc. Food broiler. 3,721,178, Cl. 99-386.000.

Szostak, Roland; Hartwig, Karl; Maurischat, Gunter; Schnall, Gunter; and Vossnacke, Jurgen, to Agfa-Gevaert Aktiengesellschaft. Developing unit for electrostatic copying apparatus. 3,721,209, Cl. 118-2.000.

Tack, Carl E.; and Rodgers, Loyal J., to Amsted Industries Incorporated. Mounting for pin bearing block. 3,721,482, Cl. 308-72.000.

Taguchi, Masayoshi: *See—*
Nakajima, Hitoshi; Chono, Masazumi; Taguchi, Masayoshi; Sakurai, Tokio; and Matsuo, Noriak, 3,721,705.

Taira, Yoshiharu, to Sony Corporation. Color television receiver. 3,721,751, Cl. 178-5.40p.

Takahashi, Kei: *See—*
Yamamoto, Hisao; Inaba, Shigeho; Arasaki, Seitetsu; Aruyama, Isamu; Takahashi, Kei; Saito, Chiharu; and Sakai, Shigeru, 3,721,671.

Takahashi, Masaru: *See—*
Shiba, Tadahisa; Tsuruki, Junzo; Takahashi, Masaru; Goto, Kunihiro; and Ono, Isao, 3,721,546.

Takahashi, Nobuo: *See—*
Hino, Hazime; Nakamura, Tsutomu; and Takahashi, Nobuo, 3,720,983.

Takamatsu, Masanobu: *See—*
Tominaga, Hiroshi; and Takamatsu, Masanobu, 3,721,091.

Takeda Chemical Industries, Ltd.: *See—*
Fujino, Masahiko; and Hatanaka, Chitoshi, 3,721,662.

Takeda, Shigekazu. Cylindrical bodies from polyethylene or polypropylene. 3,721,603, Cl. 161-92.000.

Tamburri, Michael. Mechanical smoking device. 3,721,240, Cl. 128-208.000.

Tanabe Kakoki Co., Ltd.: *See—*
Shiina, Toshio; and Tisaki, Tatu, 3,721,743.

Tanaka, Atsuyuki, to Minolta Camera Kabushiki Kaisha. Control apparatus for film travel actuated by picture frame edge signals. 3,721,495, Cl. 355-41.000.

Tannahill, Alex L.: *See—*
Finn, Robert K.; and Tannahill, Alex L., 3,721,622.

Taphorn, Bodo Egon: *See—*
Randau, Helmut Klaus; and Taphorn, Bodo Egon, 3,721,223.

Tarnopol, Milton S.; and Snyder, Thomas P., to PPG Industries, Inc. Applying electroconductive heating circuits to glass. 3,721,594, Cl. 156-89.000.

Tarnopol, Milton S.; and Snyder, Thomas P., to PPG Industries, Inc. Applying electroconductive heating circuits to glass. 3,721,595, Cl. 156-89.000.

Tascher, Edward R.: *See—*
Klohr, Robert; Tascher, Edward R.; Beld, John W.; and Koenig, Elmer A., 3,721,241.

Taylor, Ian K.; and Jones, Maurice R., to Cincinnati Milacron Inc. Apparatus for commanding a deceleration in numerical control systems. 3,721,811, Cl. 235-151.110.

Taylor, John Paul: *See—*
Sherrill, Ernest Kohn; and Taylor, John Paul, 3,721,273.
Sherrill, Ernest Kohn; and Taylor, John Paul, 3,721,274.

Teeg Research, Inc.: *See—*
Woerner, paul F., 3,721,577.

Tehobald, Donald J., to United States of America, Navy. DC to submicrosecond frequency change detector. 3,721,913, Cl. 329-102.000.

Teijin Chemicals Limited: *See—*
Yokoyama, Ryoichi, 3,721,683.

Teijin Limited: *See—*
Ishida, Kinyu, 3,721,081.

Teledyne, Inc.: *See—*
Schaffer, Philip O.; Hoverter, Bryce E.; and Haas, Kenneth C., 3,721,204.

Telemation, Inc.: *See—*
Craig, Philip V. C., 3,721,755.

Teller, Aaron J., to Teller Environmental Systems, Inc. Process for recovery of acid gases. 3,721,066, Cl. 55-71.000.

Teller Environmental Systems, Inc.: *See—*
Teller, Aaron J., 3,721,066.

Tellier, Jacque C. T.; and De Boer, Henri G. J., to GAF Corporation. Electrophotographic reproduction material. 3,721,552, Cl. 96-1.500.

Tem-Cole, Inc.: *See—*
Weasel, George E., Jr.; and Weimer, Harold W., 3,721,301.

Teppichfabrik Melchnau AG: *See—*
Reinhard, Paul, 3,721,372.

Teramura, Kazuhiro; and Ishizuka, Terukazu, to Mitsubishi Chemical Industries Limited. Process for flame proofing treatment. 3,721,581, Cl. 117-137.000.

Terasawa, Kichitaka, to Tokyo Shibaura Electric Co. Ltd. Apparatus for producing X-rays from an electric insulator. 3,721,847, Cl. 313-55.000.

Tesa S. A.: *See—*
Muller, Albert, 3,721,012.

Tesoro, Giuliana C., to Stevens, J. P., & Co. Modification of reactive hydrogen containing polymers with amino epoxy phosphonates. 3,721,523, Cl. 8-196.000.

Texaco Inc., mesne: *See—*
Wolf, Robert L.; and McGann, Rodney, 3,721,093.

Texas Instruments, Incorporated: *See—*
Baker, Charles E., 3,721,756.
Helms, John D.; and Cecil, Olin B., 3,721,210.

Textron, Inc.: *See—*
Brandli, Ronald I.; and Gjovik, James R., 3,721,308.

Th. Goldschmidt A.G.: *See—*
Fischer, Werner; and Schmitt, Felix, 3,721,692.

Thakore, Kaushik H., to Bendix Corporation, The. Single transistor oscillator blasting device. 3,721,884, Cl. 320-1.000.

Theilen, Rolf: *See—*
Van Der Werf, Chien; and Theilen, Rolf, 3,721,327.

Thermo Electron Corporation: *See—*
Kitrilakis, Sotiris S., 3,721,509.

Thevis, Paul; Schneider, Adolf; and Jakubaschk, Horst, to Olympia Werke AG. Rockable impression device for a printing machine. 3,721,186, Cl. 101-297.000.

Thieme, Gerhard: *See—*
Gehlen, Hermann Walter; Hartmann, Karl; and Thieme, Gerhard, 3,720,980.

Thiffault, Charles A. Compositions for and method of lowering cholesterol levels. 3,721,735, Cl. 424-195.000.

Thiokol Chemical Corporation: *See—*
Mazzeo, Michael P.; Gobran, Riad H.; Santaniello, Anthony F.; and Gillis, Marina N., 3,721,647.

Thomas & Betts Corporation: *See—*
Landis, David M., 3,721,246.

Thomas, Dalton A. Safety brake system for vehicles. 3,721,310, Cl. 180-111.000.

Thomas, Edmond Joseph, to Bell Telephone Laboratories, Incorporated. Echo path delay simulator for use with adaptive echo cancellers. 3,721,777, Cl. 179-170.200.

Thomas, Roy L., Jr., to Supper, Charles, Company, Incorporated. Fail-safe high-energy radiation shuttering apparatus. 3,721,826, Cl. 250-105.000.

Thompson, Tom H. Self compensating disc brake apparatus. 3,721,322, Cl. 188-196.00p.

Thompson, William B.: *See—*
Jones, Rexford W.; and Thompson, William B., 3,721,561.

Thomson, David P., to Chicago Swimming Pool Manufacturing Inc. Prefabricated swimming pools. 3,720,964, Cl. 4-172.190.

Thomson, Lois J.: *See—*
Lazzarini, Louis P., 3,721,145.

Thomson, Lois J., as Trustees of the estate of: *See—*
Lazzarini, Louis P., 3,721,145.

Thomson-CSF: *See—*
Gigoux, Claude R.; and Putz, Antide, 3,721,612.
Lamy, Michel; and Billard, Jacques, 3,721,921.

Thorn, Richard P.: *See—*
Skala, Dennis P.; and Thorn, Richard P., 3,721,417.

Thurman, R. E. Credit and pass card identification device. 3,721,128, Cl. 73-432.00r.

Tidd, James Alfred, to Graphic Systems, Inc. Character storage apparatus with individually replaceable, accurately located character fonts. 3,721,174, Cl. 95-85.000.

Tidwell, Joe Dean. Factory fabricated fireplace construction. 3,721,225, Cl. 126-120.000.

Tilford, Charles Harmon, to Richardson-Merrell, Inc. Substituted pyrrolemethylamines. 3,721,673, Cl. 260-268.00h.

Tilp, Paul: *See—*
Schulte-Schrepping, Karl-Heinz; Kaufmann, Lothar; and Tilp, Paul, 3,721,729.

Timberlake, Marshall, (Mrs.): *See—*
Landrum, Porter, 3,721,430.

Timchenko, Viktor Anatolievich: *See—*
Paton, Boris Evgenievich; Medovar, Izrailevich Boris; Latash, Jury Vadimovich; Chekotilo, Leonty Vasilievich; Baglai, Vitaly Mikhailovich; Artamonov, Viktor Leonidovich; Garkaljuk, Rodimir Ivanovich; Timchenko, Viktor Anatolievich; Malichekno, Evgeny Fedorvich; Stupak, Leonid Mikhailovich; and Dubinsky, Rudolf Solomonovich, 3,721,286.

Timms, Richard H.: *See—*
Holman, Leonard; and Timms, Richard H., 3,721,460.

Tinch, David H.; Campbell, Raymond L., Jr.; Eliahou, Elie S.; and Schmidt, Arthur W., to Schlumberger Technology Corporation. Methods and apparatus for processing well logging data. 3,721,960, Cl. 73-152.000.

Tipton, Joe D.: *See—*
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Tisaki, Tatu: *See—*
Shiina, Toshio; and Tisaki, Tatu, 3,721,743.

Toan, Danforth W., 57.1% to Warner, Burns, Toan and Lunde, 14.3% to Node 4 Associates, Inc., 14.3% to Gershen, Alvin E., Associates, Inc. and 14.3% to Hughes, Robert, Associates, Ltd. Vertical modular construction having insertable units. 3,721,056, Cl. 52236.000.

Tokyo Electric Power Co., Inc., The: *See—*
Oishi, Hiroshi; Aoki, Fumio; Kawano, Shigeru; Kikuta, Setsuo; and Shirakawa, Masami, 3,721,830.

Tokyo Shibaura Electric Co. Ltd.: *See—*
Terasawa, Kichitaka, 3,721,847.

Tokyu Sharyo Seizo Kabushiki Kaisha: *See—*
Tominaga, Hiroshi; and Takamatsu, Masanobu, 3,721,091.

Tolkmith, Henry; Seiber, James N.; and Budde, Paul B., to Dow Chemical Company, The. Method for inverting d and l configurations of optically actine isomers of asymmetrical organophosphorous compounds. 3,721,677, Cl. 260-309.000.

Tolstoshev, Alexandr Vasilievich: *See—*
Sereda, Nikolai Ivanovich; Sysun, Viktor Viktorovich; Skvortsov, Boris Vasilievich; Fisher, Viktor Davydovich; and Tolstoshev, Alexandr Vasilievich, 3,721,917.

Tominaga, Hiroshi; and Takamatsu, Masanobu, to Tokyu Sharyo Seizo Kabushiki Kaisha. Impact hydraulic forming device. 3,721,091, Cl. 60-54.50h.

Toray Industries, Inc.: *See—*
Minami, Keiichi; Nakaue, Tokuji; Susami, Kozo; Masaaki, Tabata; and Hirota, Masakazu, 3,721,070.

Total (Power Hydraulics) Limited: *See—*
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Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Jinbo, Shoji; Kedo, Setsuo; and Yaegashi, Takehisa, 3,721,794.

Traber, Walter; Hambock, Heinz; and Weiss, Anton Georg, to Ciba-Geigy Corporation. O,N-Diphenyl-carbamic acid esters. 3,721,699, Cl. 260-471.00c.

Tracy, Richard A.; and Garate, Julian C. Roll and sway control assembly. 3,721,457, Cl. 280-112.00a.

Trane Company, The: *See—*
Porter, James M., 3,721,109.

Transi-Coil Corporation: *See—*
Schweizer, Edward E., 3,721,324.

Trapani, Richard G.; and Rolnick, Benjamin, to General Electric Company. Tunnel diode supply voltage control. 3,721,837, Cl. 307-286.000.

Trawick, Stewart I.: *See—*
Childree, Herman I.; and Trawick, Stewart I., 3,721,226.

Trechock, Jack: *See—*
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Trenchard, Margaret R.: *See—*
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Trenchard, Sidney C., to Trenchard, Margaret R. Surgical pad method for decubitus ulcer management. 3,721,232, Cl. 128-24.00r.

Trott, Gene F.; and Starita, Joseph M., to General Electric Company. Surface treatment polymer structures. 3,721,580, Cl. 117-118.000.

True, Cecil Wayne. Apparatus for removing fluids from fluid supply pipes. 3,721,259, Cl. 137-270.000.

Truesdell, Stanley E.: *See—*
Pituch, Thomas R.; Truesdell, Stanley E.; and Winston, Brian W., 3,721,601.

Trumpf & Co.: *See—*
Leibinger, Berthold; Herb, Eugen; and Klingel, Hans, 3,721,154.

TRW Inc.: *See—*
Witte, Robert S.; Dailey, C. Lee; Eck, Milford J.; and Rutherford, Walter H., 3,721,916.

Tschermak, Manfred, to Siemens Aktiengesellschaft. Process for the manufacture of a rigid connection between a synthetic body and a metal body. 3,720,996, Cl. 29-527.100.

Tsi, Inc.: *See—*
Feldman, Rubin, 3,721,804.

Tsuchiya, Kaichi: *See—*
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Tsuchiya, Noboru; and Kawakami, Hirotake, to Sony Corporation. Sound signal delay device. 3,721,925, Cl. 333-30.000.

Tsuji, Atsuo: *See—*
Murai, Koichi; Akazome, Giichi; Choshi, Yasuo; Kobayashi, Toshiaki; and Tsuji, Atsuo, 3,721,682.

Tsuruki, Junzo: *See—*
Shiba, Tadahisa; Tsuruki, Junzo; Takahashi, Masaru; Goto, Kunihiro; and Ono, Isao, 3,721,546.

Tubbs, Howard A. Well system with improved pitless adapter assembly. 3,721,296, Cl. 166-88.000.

Tuncer, Mehmet Fahri. Steam-hydrocarbon reformer with a support system for catalyst tubes therein. 3,721,531, Cl. 23-288.00m.

Turner, Harold Dale; and Fletcher, John Karl, to Weyerhaeuser Company. Method and apparatus for orienting wood flakes. 3,721,329, Cl. 198-33.00r.

Ty-Lok Assembly Systems, Inc.: *See—*
Countryman, Albert J., 3,721,750.

Tyco Laboratories, Inc.: *See—*
Jasinski, Raymond J.; and Gaines, Lewis H., 3,721,586.

Tyco Laboratories Incorporated: *See—*
Entine, Gerald; Cocks, Franklin H.; and Mitchell, Carl Rice, 3,721,938.

Uebele, Curtis E.; Griffith, Russell K.; and Rosen, Irving, to Standard Oil Company, The. Rubber modified olefinic nitrile-vinyl aromatic-maleimide interpolymers. 3,721,724, Cl. 260-880.00r.

Ueda, Kazunori; Masuo, Eiichi; Yagi, Hiroaki; and Nishimoti, Sinya, to Matsushita Electric Industrial Co., Ltd. Method for attaching wires to a flat article. 3,721,003, Cl. 29-628.000.

Ueno, Saburo; Shimogo, Etsuzo; Kawasaki, Takao; Inmaru, Daisaku; Hirose, Fumio; Heya, Satoshi; Omura, Yoshio; Osaka, Yoshiaki; Fujii, Takayoshi; and Otake, Osamu, to Kureha Kagaku Kogyo Kabushiki Kaisha. Novel antibacterial compounds and a process for the reparation of the same. 3,721,667, Cl. 260-240.00a.

Unger, Richard: *See—*
Muller-Calgan, Helmut; Unger, Richard; and Enenkel, Hans Joachim, 3,721,672.

Union Carbide Corporation: *See—*
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Union Oil Company of California: *See—*
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Fenton, Donald M., 3,721,715.

Union Rheinische Braunkohlen Kraftstaff Aktiengesellschaft: *See—*
Fremery, Max; Hover, Hermann; and Schwarzlose, Gert, 3,721,615.

Union Tank Car Company: *See—*
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Unistrut Corporation: *See—*
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United Aircraft Corporation: *See—*
Albert, Aristide A., 3,721,404.
Chapkovich, John Steven, Jr.; and Lee, David Ernest, 3,721,415.
Monteleone, Robert A., 3,721,507.
Morrison, Abraham; and Hetzer, Frederick C., 3,721,089.
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United Gas Industries Limited: *See—*
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United Kingdom of Great Britain and Northern Ireland, Minister of Aviation Supply in Her Britannic Majesty's Government of the: *See—*
Allard, Robert; and Clarke, John Lawton, 3,721,981.

United States Catheter and Instrument Corporation: *See—*
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United States Gypsum Company: *See—*
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United States of America
Air Force: *See—*

McConnell, Bobby D.; Lavik, Melvin T.; and Campbell, Mahlon E., 3,721,625.
Army: *See—*
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Navy: *See—*
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Falterman, Charles W.; Griffith, William J.; and Fletcher, Perry L., 3,721,031.
Fugitt, Ronald Bruce, 3,721,500.
Hess, William J., 3,721,835.
Hubbard, William C.; Geren, Keith E.; and Sauer, Warren A., 3,721,949.
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Upjohn Company, The: *See—*
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Folz, Sylvester D., 3,721,740.
Folz, Sylvester D., 3,721,742.
Upmeier, Hartmut, to Windmoller & Holscher. Extruder for working on thermoplastic materials and non-cross-linked elastomerc materials. 3,721,427, Cl. 259-191.000.
Urban, Ralph L.: *See—*
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U.S. Industries, Inc.: *See—*
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U.S. Philips Corporation: *See—*
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Naruse, Yohsuke; Utsunomiya, Kimtake; and Fuse, Yuzo, 3,721,853.
Valcovny Plechie, Narodni podnik: *See—*
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van der Lely, Cornelis. Tractors. 3,721,077, Cl. 56-15.600.
Van Der Tas, Johannes Cornelis: *See—*
Boekkooi, Anton; Hurx, Ardianus Antonius; Van Der Tas, Johannes Cornelis; and Meulemans, Charles Cornelis, 3,721,515.
Van Der Werf, Chien; and Theilen, Rolf, to Olympia Werke AG. Storing and interlocking typewriter input mechanism. 3,721,327, Cl. 197-107.000.
Van Doorne, Guy Camille, to Labofina S.A. Process for the improvement of the constitution of soils. 3,721,043, Cl. 47-58.000.
Van Leeuwen, Gerrit Hendrik. Anti-microbial compositions containing histaminase. 3,721,733, Cl. 424-94.000.
Van Listhout, Jan August; and Jaeken, Jan, to Agfa-Gevaert N.V. Colour radiography. 3,721,823, Cl. .
Van Pool, Joe: *See—*
Chapman, Charles C.; Cannady, William P.; and Van Pool, Joe, 3,721,720.
Vanderlinden, Richard J., to Union Tank Car Company. Crank operated tan bottom plug valve. 3,721,424, Cl. 251-144.000.
Vanderpool, Clarence D.: *See—*
Chiola, Vincent; Smith, James S.; and Vanderpool, Clarence D., 3,721,852.
VanHeertum, Johannes Josephus: *See—*
De Haes, Louis Maria; Gevers, Hugo Karel; and VanHeertum, Johannes Josephus, 3,721,559.
Vargiu, Silvio; and Passalenti, Beppino, to Societa Italiana Resine S.p.A. Unsaturated polyester resin compositions. 3,721,643, Cl. 260-40.00r.
Vatterodt, Karl; and Weiss, Werner, to Patent-Treuhand-Gesellschaft fur elektrische Gluhlampen mbH. Electrically heated pit furnace, particularly for melting vitreous silica. 3,721,744, Cl. 13-25.000.
VEB Filmfabrik Wolfen-Fotochemisches Kombinat: *See—*
Lukaschewitz, Heinz Kurt; Buchmann, Johannes Walter; and Walther, Bernard Lpu, 3,721,364.
VEB Pentacon, Kamera- und Kinowerke: *See—*
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VEB Vereinigte Baumwollspinnererin und Zwirnerein: *See—*
Munzner, Gerald Johannes, 3,721,082.
Velter, Raphael Joris; and Meyer, Karl-Otto, to Gevaert-Agfa N.V. Gelatino silver halide emulsion containing a halogenated aldehyde acid and a perhydrotriazine compound as hardening agents. 3,721,564, Cl. 96-111.000.
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Venetta, Henry J., to Venetta Engineering. Furnace charging apparatus. 3,721,519, Cl. 263-6.00r.
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Verhoeven, Leonardus Adrianus Johannes, to U.S. Philips Corporation. Frequency divider. 3,721,904, Cl. 328-39.000.
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Viewlex, Inc.: *See—*
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Vincent, Eric F. Natural ice rink mould. 3,721,418, Cl. 249-1.000.
Viracola, Joseph R. Impact relief pressure switch for roadway vehicle detector. 3,721,784, Cl. 200-86.00r.
Virginia Plastics Company: *See—*
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Visos, Charles D.; Love, John J.; and Banes, Ralph E., to Emerson Electric Co. Stepped opening fluid pressure operated valve. 3,721,263, Cl. 137-495.000.
Voelskow, Peter, to Siempelkamp, G., & Co. Method of and apparatus for the drying of comminuted material. 3,721,014, Cl. 34-10.000.
Vogel, George R. Reciprocating motor. 3,721,873, Cl. 318-128.000.
Vogt, Gerd; Wunnenberg, Klaus; and Dubendorff, Joachim, to Mannesmann Aktiengesellschaft. Method of continuous casting of steel using an oscillating mold. 3,721,288, Cl. 164-83.000.
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Walker, Charles W., to United States of America, Navy. Collection and disposal of ship's sewage. 3,721,207, Cl. 114-.50r.
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Weidler, Charles Harry, to AMP Incorporated. Flexible strip for electrical connectors or the like. 3,721,944, Cl. 339-19.000.
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Welwyn Electric Limited: *See—*
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Wendt, Gerhard R.; Ledig, Kurt W.; and Oliver, Donald W., to American Home Products Corporation. Quaternary ammonium salts of 17α-aminoalkynyl-19-norsteroidal 3,5-dienes. 3,721,688, Cl. 260-397.500.
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Wilhelm, Hans; Gulbins, Klaus; and Hartmann, Heinrich, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Crosslinkable coating agents. 3,721,640, Cl. 260-31.20n.
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Wilmanns, Ingo; and Barz, Alfred, to Leybold-Heraeus-Verwaltung GmbH. Process monitoring and control arrangement. 3,721,897, Cl. 328-141.000.
Wilmot, George E., Jr., to United Aircraft Corporation. Ejector with variable mixing section and primary nozzle areas. 3,721,387, Cl. 239-416.400.
Wilson, Jack P., to Proctor & Schwartz, Inc. Method of treating spent grain. 3,721,568, Cl. 99-80.00b.
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Wilson, Richard W., to Motorola, Inc. Contact for piezoelectric crystals. 3,721,841, Cl. 310-9.400.
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Wisser, William L., to Narco Scientific Industries, Inc. Multiple socket connector apparatus. 3,721,941, Cl. 339-17.0cf.
Witte, Robert S.; Dailey, C. Lee; Eck, Milford J.; and Rutherford, Walter H., to TRW Inc. Cold cathode construction for gaseous laser. 3,721,916, Cl. 331-94.500.
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Wittgenstein, Gerard Francis. Safety installation for preventing pollution by pipelines. 3,721,270, Cl. 138-104.000.
Witzel, Bruce E.; Shen, Tsung-Ying; Graham, Patricia M.; Clark, Robert L.; and Pessolano, Arsenio A., to Merck & Co., Inc. Certain 3-amino-2(1h) pyridones. 3,721,676, Cl. 260-296.00r.

Woerner, paul F., to Teeg Research, Inc. Process for the deposition of refractory metal and metalloid carbides on a base material. 3,721,577, Cl. 117-46.0cg.

Wojcik, Robert J., to Pettibone Corporation. Pressure control system for a grinding machine and actuating unit therefor. 3,721,045, Cl. 51-35.000.

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Yamamoto, Hisao; Inaba, Shigeho; Arasaki, Seitetsu; Aruyama, Isamu; Takahashi, Kei; Saito, Chiharu; and Sakai, Shigeru, to Sumitomo Chemical Co., Ltd. Novel quinazolinone derivatives 2-alkyl-3-(3'-methylpyridine-2'-yl)-5-chloro-4 (3h)-quinazolinone. 3,721,71, Cl. 260-256.40q.

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Yarber, Gordon W. Friction coefficient compensating braking apparatus. 3,721,321, Cl. 188-726.000.

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Yates, Raymond W., to British Industrial Plastics Limited. Cationic resin prepared by two stage condensation of melamine, formaldehyde and aliphatic hydroxylated monoamine. 3,721,651, Cl. 260-29.40r.

Yazawa, Yasaburo; and Kawazoko, Yoshiako, to Nippon Kokan Kabushiki Kaisha. Apparatus for continuous cold rolling. 3,721,114, Cl. 72-231.000.

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Yoder, Reuben D. Baby tender. 3,721,414, Cl. 248-175.000.

Yokotsuka, Tamotsu; Iwaasa, Takashi; and Fujii, Mitsuharu, to Kikkoman Shayu Co., Ltd. Glutaminase Ga. 3,721,606, Cl. 195-62.000.

Yokoyama, Ryoichi, to Teijin Chemicals Limited. Process for the preparation of aromatic carboxylic anhydrides. 3,721,683, Cl. 260-346.400.

Yonemoto, Hiroshi; and Kawakyu, Koichi, to Sony Corporation. Magnetic recording and/or reproducing apparatus with signal muting during change of operative condition. 3,721,774, Cl. 179-100.2md.

Yoshida, Mikihiko; and Mamoru, Hirao, to Hayashibare Company. Process for producing amylose in industrial scale. 3,721,605, Cl. 195-31.00r.

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Young, Charles J. Interlocking puzzle. 3,721,446, Cl. 273-157.00r.

Young, Harold K.; and Wald, Herbert, to Bethlehem Steel Corporation. Exhaust system for furnace retort. 3,721,429, Cl. 261-123.000.

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Zakaski, Roman, to Monty Enterprises, Inc. Portable washing stand. 3,720,963, Cl. 4-167.000.

Zanders, Jan H. P. A., to Oce-van der Grinten N.V. Apparatus for collating sheets. 3,721,435, Cl. 271-64.000.

Zaugg, Roland, to Schild, A., S.A. Calendar driving mechanism for date and week day indicating timepiece. 3,721,085, Cl. 58-58.000.

Zeile, Karl: *See—*
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Zeller, Robert D., to Holophane Company, Inc. Luminaire. 3,721,816, Cl. 240-64.000.

Zemlin, John C., to Liner Technology, Inc. Polyurethanes stabilized with 1,2,3-1,2,4-1,2,5- and 1,3,4-triazoles. 3,721,645, Cl. 260-45.80n.

Ziernicki, Robert S., to Overton, Marvin C., III. High-gain monitor to determine electro-cerebral silence. 3,721,230, Cl. 128-2.10b.

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Zysman, Milton. Spring upholstery cushioning. 3,720,966, Cl. 5-353.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 20TH DAY OF MARCH, 1973

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Alexander, William L.: *See*—
Fain, Jacob M., and McDonnell. Re. 27,601.
Beckmann, Rolf E. V.: *See*—
Stewart, John K., and Beckmann. Re. 27,604.
Canron Ltd.: *See*—
Stewart, John K., and Beckmann. Re. 27,604.
Carrier Corp.: *See*—
Stankavich, Anthony J. Re. 27,603.
Eide, Melvin O., to United Control Corp. Amplifier with floating input. Re. 27,602, 3–20–73, Cl. 33—24.
Fain, Jacob M., and E. McDonnell, to William L. Alexander, William G. Mulligan, and Foster Dee Snell, trustees for the stockholders of Twenty-Nine West Fifteenth Street Corp. Novel water-repellent compostions. Re. 27,601, 3–20–73, Cl. 260—2 S.
Laney, Nelll M. Vehicular towed camping trailer. Re. 27,605, 3–20–73, Cl. 296—23 R.
McDonnell, Edward: *See*—
Fain, Jacob M., and McDonnell. Re. 27,601.
Mulligan, William G.: *See*—
Fain, Jacob M., and McDonnell. Re. 27,601.
Snell, Foster Dee: *See*—
Fain, Jacob M., and McDonnell. Re. 27,601.
Stankavich, Anthony J., to Carrier Corp. Process of Producing an electrical resistor. Re. 27,603, 3–20–73, Cl. 117—227.
Stewart, John K., and R. E. V. Beckmann, to Canron Ltd. Workhead positioning means. Re. 27,604, 3–20–73, Cl. 104—12.
Twenty-Nine West Fifteenth Street Corp.: *See*—
Fain, Jacob M., and McDonnell. Re. 27,601.
United Control Corp.: *See*—
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Anderson, Eldon L., Jr., to General Electric Co. Luminaire. 226,535, 3–20–73, Cl. D48—31.
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Katayama, Masaharu, and Arai. 226,536.
Beckman, Glenn B., to Corning Glass Works. Filter drip adaptor for coffee maker. 226,531, 3–20–73, Cl. D44—26 B.
Bobrowski, Loius G., to The Stanley Works. Sliding door chain guard. 226,515, 3–20–73, Cl. D8—131.
Braun, W., Co.: *See*—
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Brindisi, Frederick J., to Qualitrol Corp. Pressure relief valve. 226,524, 3–20–73, Cl. D23—19.
Carasso, Daniel, to Compagnie Gervais-Danone. Mold for comestibles or similar article. 226,530, 3–20–73, Cl. D44—1 L.
Caterpillar Tractor Co.: *See*—
Wetherill, Richard H., and Gregg. 226,518.
Chef Pierre, Inc.: *See*—
Dendrinos, Peter C. 226,522.
Cicero, Edward L. Golf putter head. 226,526, 3–20–73, Cl. D34—5.
Compagnie Gervais-Danone: *See*—
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Cooper, Howard. Bottle. 226,519, 3–20–73, Cl. D9—28.
Cooper, Howard. Bottle. 226,520, 3–20–73, Cl. D9—39.
Coppuck, Gordon L., to Bruce McLaren Motor Racing Ltd. Model racing car. 226,527, 3–20–73, Cl. D34—15.
Corning Glass Works: *See*—
Beckman, Glenn B. 226,531.
Cressy, Clifford E. Combined lawn mower and grass catcher. 226,528, 3–20–73, Cl. D40—1 B.
Daher, Theodore G., to General Electric Co. Clock or similar article. 226,529, 3–20–73, Cl. D42—7.
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Ishii, Motoko, to Yamagiwa Electric Co. Ltd. Chandelier. 226,532, 3–20–73, Cl. D48—3.
Katayama, Masaharu, and N. Arai, to Matsushita Electric Industrial Co., Ltd. Television receiver. 226,536, 3–20–73, Cl. D56—4.
Lerner, Nathan B., to W. Braun Co. Combined bottle and closure therefor. 226,521, 3–10–73, Cl. D9—118.
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CLASSIFICATION OF PATENTS

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DESIGN PATENTS

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Frederick B. Dent, Secretary

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Robert Gottschalk, Commissioner